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PRELIMINARY
STAFF REPORT ON CONSISTENCY DETERMINATION

Consistency Determination No. CD-061-01
Staff: LS/LE/JD/AW-SF
File Date: 6/28/2001
60th Day: 8/27/2001
75th Day: extended through 10/31/2001
Commission Meeting: 8/9/2001

FEDERAL AGENCY: **U.S. Fish and Wildlife Service**

PROJECT LOCATION: Bolsa Chica Lowlands, Orange County **(Exhibits 1-3)**.

PROJECT DESCRIPTION: Construction of wetland restoration project. Approximately 366.5 acres would be restored to full tidal influence, 200 acres would receive muted tidal influence via culverts to the full tidal area, 120 acres would be left unchanged as seasonal pond habitat, and 252 acres would be reserved as a future full tidal area once oil field operations terminate in 15-20 years. Project includes buying out and abandoning oil wells located on a portion of the acquired Lowlands property and on the adjacent State Ecological Reserve, dredging 2.7 million cu.yds. of material to create a tidal basin, constructing an earthen berm around the perimeter of the basin except where adjacent to the flood control channel levee, constructing an ocean inlet to the basin, constructing a Pacific Coast Highway bridge (including pedestrian and bicycle lanes separate from vehicle traffic lanes) over the ocean inlet, constructing a French drain between project wetlands and existing residential development, and disposing dredged materials to create the basin berm, PCH bridge approaches, bird nesting islands, and to pre-nourish the beach and offshore ebb bar. Construction would take approximately three years. The project includes provisions for operation, maintenance, monitoring, and remediation of the restored wetlands.

Staff Note:

The staff is providing a preliminary staff report at this time (and not a proposed recommendation and findings) on CD-061-01 due to the complexity of the proposed wetland restoration project, the complex history behind the development of the current proposal, the unprecedented scope of and benefits arising from the project, the potential for significant adverse effects generated by several project features, and the belief that more than one Commission hearing will be necessary in order for all project elements, Coastal Act issues, and public comments to be fully examined and considered by the Commission. The U.S. Fish and Wildlife Service extended the statutory time deadline for Commission action on the consistency determination from September 11 to October 31 so that a vote on the consistency determination would not be required at the August 9 hearing.

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EXECUTIVE SUMMARY

The U.S. Fish and Wildlife Service (Service) has submitted a consistency determination for the restoration of the Bolsa Chica Lowlands, located inland of Pacific Coast Highway on the northern Orange County coastline. The subject consistency determination represents the second phase of a two-phase federal consistency process that began with the submittal in 1996 of a consistency determination by the U.S. Fish and Wildlife Service (Service) for wetland restoration activities at Bolsa Chica. On October 6, 1996, the Commission concurred with CD-115-96 (the Bolsa Chica Lowland Acquisition and Conceptual Wetland Restoration Plan).

That conceptual plan called for the California State Lands Commission (SLC) to purchase 880 acres of wetland habitat, for the Service to restore 385 acres to full tidal wetlands and 220 acres to managed tidal wetlands, and for the retention of 275 acres of the lowlands as an active oil production field (and designated as a future full tidal area). The conceptual plan concurred with by the Commission included construction of an ocean inlet at the southern end of the lowlands for improved tidal circulation, preliminary fish and wildlife habitat restoration objectives, and elements regarding public access and recreation, oilfield operations, and long term maintenance, operation, and monitoring of the restoration project. Acquisition and wetland restoration was funded primarily from a $78.75 million contribution from the Ports of Los Angeles and Long Beach in exchange for 524 acres of mitigation credits for port landfill construction. The SLC completed the Bolsa Chica acquisition on February 14, 1997, and mitigation credits were released to the ports for landfill projects.

The proposed project includes creation of approximately 366 acres of full tidal and 200 acres of muted tidal wetland habitat, retention of 120 acres of existing seasonal pond habitat, designation of 252 acres as a future full tidal area, construction of an ocean inlet and jetties across Bolsa Chica State Beach, construction of a new Pacific Coast Highway bridge (vehicle traffic and bicycle/ pedestrian lanes) over the ocean inlet, dredging 2.7 million cu.yds. to create a tidal basin in the Lowlands, disposal of dredged materials to create a basin berm, nesting islands, and an ebb bar offshore of the ocean inlet, pre-nourishing beaches adjacent to the ocean inlet, construction of a French drain between the restoration project and adjacent housing development, and other construction and mitigation components.

This preliminary staff report provides a review of the history and background of the current restoration project. Next, additional details on project elements, benefits and impacts, long-term management of the restored wetland, and the status of the oilfield cleanup project are provided. The proposed project is then evaluated using the dredging and filling, shoreline structures and coastal processes, public access and recreation, water quality, and environmentally sensitive habitat policies of the Coastal Act. As a part of this evaluation, subject areas are identified where additional information and/or analysis of potential project impacts on coastal resources are needed in order to determine project consistency with the Coastal Act.

I. Project Description.

A. **Site Location and Description.** The consistency determination describes the wetland restoration project site as follows (**Exhibits 1 and 2**):

> *The Bolsa Chica Project area consists of 1,247 acres of the Bolsa Chica Lowlands in the Bolsa Gap between Bolsa Chica Mesa on the northwest and Huntington Mesa on the southeast, in an unincorporated area of northwestern Orange County. The site is bordered by Warner Avenue on the northwest, residential areas of Huntington Beach on the east, Pacific Coast Highway (PCH) and Bolsa Chica State Beach on the west.*
>
> *A century ago, Bolsa Chica was part of an extensive tidal marsh, including a mosaic of vegetated salt and brackish marsh, with associated tidal embayments, sloughs, mudflats and a direct connection to the ocean. In 1899, Bolsa Chica was diked to prevent tidal exchange in order to manage the resultant ponds as a waterfowl hunting club. Subsequently, the site was further altered by filling, oil extraction activities, flood control facilities, and surface and subsurface hydrologic modifications. Bolsa Chica still contains a significant fraction of the historical marsh system, but its wetland and aquatic functions have been degraded from those that existed historically. The oil well field, in operation since the 1940's, continues to be operated by AERA Energy pursuant to lease and surface use agreements.*

B. **History and Background.** In October 1996, eight state and federal agencies (California State Lands Commission, California Department of Fish and Game, State Coastal Conservancy, Resources Agency, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, National Marine Fisheries Service, and U.S. Environmental Protection Agency) and the Ports of Los Angeles and Long Beach entered into an Interagency Agreement to establish a project for wetlands acquisition and restoration at the Bolsa Chica Lowlands (**Appendix A**). The Interagency Agreement described a Concept Plan for wetland restoration and addressed: (1) the acquisition of approximately 880 acres of land in the Bolsa Chica Lowlands; (2) the restoration of wetlands, full tidal, and managed tidal habitats in the lowlands; (3) monitoring activities to determine the condition of restored habitats; and (4) the necessary operation, maintenance, and management of project features during and after construction.

The aforementioned eight state and federal agencies (known as the Steering Committee) are overseeing the ongoing development of the proposed restoration plan for the Bolsa Chica wetlands. Planning decisions are reached by consensus and rely on information, analyses, and recommendations of subcommittees made up of representatives from the Steering Committee. The Interagency Agreement delineated the following agency roles and responsibilities for the restoration project:

> State Lands Commission (SLC): Acquire and hold title to a minimum of 880 acres at Bolsa Chica; administer and disburse all monies received for the project; serve as lead agency under CEQA in the preparation of the EIR/EIS for the project; acquire, in consultation with the USFWS and Corps of Engineers, the necessary federal and state permits and approvals

for the project; operate and maintain, either directly or by agreement with another entity, the completed project.

State Coastal Conservancy: Prepare a detailed Feasibility Plan for the project, based on and consistent with the Concept Plan, and prepare a Final Plan under which the SLC may acquire the above-cited permits and approvals.

U.S. Army Corps of Engineers: Serve as one of the federal lead agencies under NEPA for preparation of the EIR/EIS for the project; administer the permit program under Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act, and Section 103 of the Marine Protection, Research and Sanctuary Act.

U.S. Fish and Wildlife Service: Conduct necessary sediment sampling, archaeological surveys, or other technical studies necessary for all permits and approvals for the project; prepare and submit a federal consistency determination to the California Coastal Commission; serve as one of the federal lead agencies under NEPA for preparation of the EIR/EIS for the project; conduct any necessary consultation under Section 7 of the Endangered Species Act; construct the restoration features of the project.

The Concept Plan included the following planning objectives for the Bolsa Chica restoration project:

- Overwintering habitat for migratory shorebirds, seabirds, and waterbirds shall be enhanced.
- Nesting habitat for migratory shorebirds and seabirds shall not be diminished and shall be expanded, where feasible.
- Habitat for estuarine/marine fishes shall be expanded and species diversity shall be increased.
- Nesting and foraging conditions for state and federal endangered species shall not be adversely affected. In addition, implementation of the plan shall contribute to the recovery of the light-footed clapper rail, California least tern, western snowy plover, and Belding's savannah sparrow.
- The mix of habitat types shall include perennial brackish ponds, seasonal ponds/sand flats, pickleweed flats, cordgrass intertidal zone, unvegetated intertidal mudflat, and marine subtidal soft bottom.
- Modifications to the hydraulic regime, necessary to achieve the above objectives, shall include an ocean inlet, full tidal range (i.e., +7.5 to –1.5 feet mean lower low water), low residence time, shall emphasize minimized requirements for manipulation and maintenance, and shall not degrade existing flood protection levels.
- Interests of contiguous property owners shall be protected.

- Once completed, maintenance and management of the area shall maximize native estuarine/ marine fish and wildlife habitat of the Bolsa Chica Lowlands in perpetuity, including active removal of detrimental, non-native biota.

- Allowable public uses shall include passive and nonintrusive recreation activities focused on peripheral areas, interpretive foci, and trails.

- Total removal of oil extraction activities and their past effects shall be conducted in a phased, cost-effective, and environmentally sensitive manner.

- Monitoring and evaluation of the success of biological objectives shall be conducted.

As provided for in the Interagency Agreement, in 1997 the Ports of Los Angeles and Long Beach provided $78.75 million to be used for wetland restoration activities, including the purchase of 880 acres in the Lowlands, in exchange for 534 acres of port landfill mitigation credits. The Final EIR/EIS examines the role of port funding and mitigation credits in the Bolsa Chica wetlands restoration project:

> *The proposed wetlands restoration would offset the loss of habitat resulting from current and future landfill construction in the Ports of Los Angeles and Long Beach. On the basis of habitat values and aquatic functions that would be created as a result of the restoration project, the Ports were granted mitigation credits sufficient to offset 454 acres of landfill in the outer harbor areas. Construction of a new ocean inlet large enough to handle tidal volumes both for the full tidal and future full tidal areas (see Section 2.1.6) and eventual reintroduction of tidal influence into the future full tidal area are expected to create habitat values and aquatic functions sufficient to offset an additional 80 acres of landfill in the outer harbor areas of the Ports. These credits have been granted. If the Bolsa Chica Lowlands Restoration Project does not generate sufficient habitat values and aquatic functions to create all 545 acres of landfill mitigation credit or if for some reason the Bolsa Chica Lowlands Restoration Project is not implemented, an alternative tidal restoration project or projects at a location or locations other than the Bolsa Chica Lowlands would be implemented to generate sufficient mitigation credits.*

The subject consistency determination represents the second phase of a two-phase federal consistency process that began with the submittal on September 12, 1996, of a consistency determination by the U.S. Fish and Wildlife Service (Service) for wetland restoration activities at Bolsa Chica. On October 6, 1996, the Commission concurred with CD-115-96 (the Bolsa Chica Lowland Acquisition and Conceptual Wetland Restoration Plan)(**Appendix B**). That conceptual plan called for the California State Lands Commission (SLC) to purchase 880 acres of wetland habitat, for the Service to restore 385 acres to full tidal wetlands and 220 acres to managed tidal wetlands, and for the retention of 275 acres of the lowlands as an active oil production field (and designated as a future full tidal area).

Acquisition and wetland restoration was funded primarily from a $66.75 million contribution from the Ports of Los Angeles and Long Beach. On October 6, 1996, the Commission also

certified port master plan amendments (POLA 15 and POLB 8) that provided each port with 227 mitigation credits for future landfill construction in their jurisdictions in exchange for their financial contributions to the Bolsa Chica acquisition and restoration program. The SLC completed the Bolsa Chica acquisition on February 14, 1997, and mitigation credits were released for use by the ports in future landfill projects. Later in 1997 the Commission certified port master plan amendments (POLA 17 and POLB 10) and concurred with a Service negative determination (ND-41-97) which provided for an additional 40 acres of mitigation credits to each port after each contributed an additional $6 million to the acquisition and restoration plan, in particular for restoration in the Future Full Tidal Area of the Lowlands.

CD-115-96 included the acquisition of lowland properties at Bolsa Chica and a conceptual wetlands restoration plan, but did not propose a final restoration plan or seek approval of any construction or restoration work. The conceptual plan included adequate details for the Commission to determine that the plan was consistent with the California Coastal Management Program and that it justified provision of landfill mitigation credits to the Ports of Los Angeles and Long Beach. These mitigation credits are currently being used by both ports for landfill construction projects.

The conceptual plan concurred with by the Commission included construction of an ocean inlet at the southern end of the lowlands for improved tidal circulation, preliminary fish and wildlife habitat restoration objectives, and elements regarding public access and recreation, oilfield operations, and long term maintenance, operation, and monitoring of the restoration project.

The Service acknowledged in CD-115-96 that the conceptual restoration plan was the first step in a phased federal consistency review process for the restoration project. Upon selection of a final restoration plan by the Federal-State Bolsa Chica Wetlands Steering Committee, the Service would then be required to submit to the Commission a second, more detailed consistency determination for wetland restoration and construction activities at Bolsa Chica. That second submittal is now before the Commission and is the subject of this staff report. (Currently there is no plan for the submittal of a coastal development permit application to the Commission for the proposed project by any of the State agency members of the Steering Committee, which believe that the proposed restoration project is properly characterized as a Federal government activity.)

Subsequent to the aforementioned Commission actions in 1996 and 1997 on consistency and negative determinations and port master plan amendments, the Commission held a public hearing at its October 14, 1998, meeting in Oceanside to receive a progress report from the Federal-State Bolsa Chica Steering Committee on its development of the restoration plan, the Environmental Impact Report and Statement, ongoing engineering tasks, and oilfield contamination and cleanup issues, and to hear both public and Commissioner comment on those issues. The Commission staff has met on an ongoing basis since 1996 with Steering Committee agency representatives to provide staff input to the process of developing a final restoration plan. The staff submitted formal comments on the Draft EIR/S for the restoration plan in October 2000, focusing primarily on potential project effects on coastal processes and water quality.

In addition to Commission review of the subject consistency determination, Exhibit XX from the Final EIR/EIS lists the other federal, state, and local approvals required for the project, including encroachment permits from the California Department of Transportation and the California Department of Parks and Recreation for the ocean inlet and PCH bridge which would cross lands owned by those agencies.

C. **Proposed Project.**

1. Project Elements. The consistency determination describes the proposed wetland restoration project as follows (**Exhibits 3 and 4**):

The Proposed Project – Concept Plan without Flood Control Diversion Structure:

The Proposed Project (attached Figure ES-1 and 2.4B) is the creation of approximately 366.5 acres of habitat that would receive a full tidal range through an ocean inlet near Huntington Mesa. The Proposed Project would not change the existing full tidal part of the Ecological Reserve (Outer Bolsa Bay) or the muted tidal portion of the Ecological Reserve (Inner Bolsa Bay). The edges of Rabbit Island would be tidal. The full tidal area would be created by:

1. *buying out and abandoning the oil wells located on a portion of the acquired property and on the adjacent State Ecological Reserve,*
2. *dredging approximately 2.7 million cubic yards (cy) of material to create a basin,*
3. *constructing a berm around the perimeter of the basin except adjacent to the flood control levee,*
4. *constructing an ocean inlet into the basin, and*
5. *constructing a bridge for PCH over the inlet channel.*

The new ocean inlet would be approximately 360 feet wide between the crest of the jetties, at +13 feet mean sea level (MSL), and would have short jetties extending approximately to the mean low tide line (Alternative A on attached Figure 8-50, and 4-2). The jetties are necessary to prevent the inlet channel from migrating. The ebb shoal will be pre-filled.

A new PCH bridge would be constructed over the inlet channel (attached Figure 10-2). Roadbed approach fills would elevate the roadway to the bridge crest elevation. The existing bikepath west of PCH, along with beach park safety vehicle access would be reconstructed on a portion of the bridge separate from the PCH traffic lanes. A separate, smaller bridge will be provided for the oil field vehicles to access the oil wells next to PCH and north of the inlet channel.

The ocean inlet would be large enough to pass tidal flows sufficient to permit the future restoration of an additional 252 acres to tidal influence. This area is referred to as the future full tidal area. This area would not be restored until oil and gas field operations cease upon depletion of the oil field within 15 to 20 years. Upon depletion of the oil field and removal of the wells and any contamination, it may be feasible to simply breach the dike

and allow a large portion of the area to become slough, tidal flats, and salt marsh without extensive earthwork.

Dredge material would be incorporated into levee and road elevation, used to construct nesting islands, or placed on or near the south end of Bolsa Chica State Beach for nearshore disposal or beach nourishment (see below FEIR/EIS Table 2-1, page 2-11). Oil wells, water injection wells, well pads, and access roads would all be removed from within the tidal area. To protect homes inland of the Lowlands from any groundwater impacts resulting from the introduction of tidal flows to the Lowlands, a French drain would be constructed between the wetlands and the housing development.

Approximately 200 acres of the project area would be muted tidal. Muted tidal flow means that the area would experience regular tidal ebb and flow, but would not be exposed to the full range of the tides. The muted tidal area would be connected to the full tidal basin by culverts through the levee.

An area of approximately 120 acres in the southeastern corner of the Bolsa Chica Lowlands would be left unchanged as seasonal ponds. Enhancement of suitable nesting areas for Belding's savannah sparrow would be achieved in the muted tidal areas, while other valuable areas would be retained intact in the seasonal pond area and in Inner Bolsa Bay. Enhancement of suitable nesting habitat for the light-footed clapper rail would be achieved in the cordgrass expansion of the full tidal area. Nesting area for the California least tern and western snowy plover would be achieved through the creation and retention of sparsely vegetated sandflat and saltflat areas protected from disturbance or water inundation.

The 252 acres in the southeast quadrant of the project area (future full tidal) are not proposed to be altered, at this time, and would remain a mosaic of oil well roads and pads and seasonal ponds and flats for many years. Water levels in these seasonal pond/oil field areas will likely require lowering either by pumping or drains in order to protect the ongoing oil field operations in years of high rainfall.

Most of the over 500 poles that formerly supported above-ground power lines would be removed from the Lowlands to reduce the adverse influence of these predatory-bird perching sites near nesting areas. Selected poles would be retained and topped with nest support platforms for great blue heron and osprey. All oil wells and oil infrastructure would be removed from the footprint of the full tidal basin. In the muted tidal, future full tidal and seasonal pond areas of the Proposed Project, oil wells, access roads, and oil pipelines would continue to operate until the lease operator concludes the field is no longer economically viable, perhaps as long as 20-30 years.

. . .

Revetments will be constructed along the seaward toe of slope along the elevated section of PCH [totaling 1,400 feet immediately updrift and downdrift of the ocean inlet]. *This is necessary to prevent damage to PCH that may result from large waves from tropical storms.*

(Such rare waves have washed over the existing beach and sand berm closing PCH.) The inlet jetties would extend about 445 feet from PCH, extending to the surf zone. Beach sand would be filled to the top of the jetties and covering the highway revetment, largely eliminating the appearance of the rock, except for the seaward ends of the jetties.

The FEIR/EIS also reports on project elements that:

Although the simulated maximum ebb velocity is below the threshold value of 6 ft/sec for bed scouring, the potential for levee toe scouring adjacent to the inlet entrance still exists. Therefore, the Proposed Project includes two separated armored levee sections totaling 4,800 linear feet to eliminate the scouring impact (Class III).

2. Benefits and Impacts. The consistency determination summarized the expected benefits and impacts to be generated by the proposed project on coastal resources (**Exhibit 5**):

Benefits:

The Proposed Project would restore full tidal wetlands function to 366.5 acres of the Bolsa Chica Lowlands and muted tidal flow to approximately 200 acres. The increased quantity and quality of open water and intertidal mudflat habitats at Bolsa Chica would provide overwintering habitat for migratory shorebirds, seabirds, and waterfowl. A healthy and diverse aquatic community of marine and estuarine invertebrates would become established in the full and muted tidal basins. Restoration of full tidal influence would recreate conditions that would be very beneficial for up to 60 species of fish that no longer exist in this part of Bolsa Chica. The full tidal basin would provide nursery habitat for the California halibut.

Nesting habitat for the state and federal endangered California least tern and the federal threatened western snowy plover would increase and will aid in the recovery of these species. In addition to supporting these endangered species, the nesting areas would provide nesting habitat for a variety of other water-associated birds, including elegant terns, Caspian terns, and Forster's terns. Cordgrass, a low salt marsh plant that generally requires a full tidal range to flourish, would expand at Bolsa Chica. The expanded cordgrass habitat is expected to support nesting by the state and federal endangered light-footed clapper rail. With the Proposed Project, as many as 15 pairs may nest in the Bolsa Chica Lowlands. Pickleweed salt marsh habitat would be enhanced by the introduction of tidal influence. Because the size of a Belding's savannah sparrow nesting territory is smaller in muted tidal and full tidal systems, the Proposed Project would support more pairs of Belding's savannah sparrows (a state endangered species) than existing conditions. About 255 more pairs of Belding savannah sparrows may nest in the project area if the Proposed Project is implemented.

In addition to providing tidal influence to much of the Lowlands, the Proposed Project would preserve several valuable nontidal habitats, including seasonal ponds/sand flats and

perennial brackish ponds. These seasonal ponds are overwintering habitat for migrating shorebirds and waterfowl during the winter. In summer, when the flats area exposed, these areas are used for nesting by western snowy plover, and several species of shorebirds. The result would be a diverse wetlands ecosystem. In summary, the Proposed Project would result in a substantial net gain in habitat value compared to existing conditions.

The Proposed Project would indirectly benefit surrounding land uses by providing an improved public passive use and visual enhancement more consistent with the nearby residential, park, beach, and commercial areas than the existing degraded oil development. New and enhanced public access opportunities would result in a beneficial impact to recreation in the project area. The tidal inlet would enhance recreational fishing opportunities. The project also may benefit the local economy by providing construction jobs for the local labor force, and increasing visitors to the area, which would benefit local businesses. The tidal influence would result in reduced mosquito control problems.

Construction Impacts:

Grading of the full tidal basin and construction of berms and the tidal inlet would result in considerable disturbance at the site. Site preparation and erosion control methods would be employed during construction (described in FEIR/EIS Section 2.7.1.3) and would reduce the impacts of this disturbance to an insignificant level.

To counteract the predicted loss of sand to the ebb bar that would form when the tidal inlet is opened, sandy material dredged from the full tidal basin would be pumped into the nearshore zone to pre-fill the ebb bar. Because some of this material may contain as much as 40 percent fine sediment, at times significant turbidity plumes extending as much as several thousand feet downcurrent may occur (Class I impact). Temporary degradation of water quality may occur from other construction activities, such as excavation of the tidal inlet, but these impacts would be localized to within a few hundred feet of the immediate construction area and would be adverse but insignificant (Class III).

Construction of the tidal inlet and pre-fill of the ebb bar would disturb marine organisms in the vicinity of these activities. Recovery of marine communities would occur rapidly after the end of construction, and impacts would be insignificant (Class III). Pre-filling the ebb bar outside the endangered least tern breeding season and peak recreational beach use period would avoid potentially significant adverse impacts to least terns and beach use.

The removal of nontidal pickleweed to construct the full tidal basin could result in the temporary loss of between 118 and 138 Belding's savannah sparrow territories. This loss represents approximately 60 percent of 213 total territories in the Bolsa Chica Lowlands (Class I impact). During construction, nontidal pickleweed outside the full tidal basin would be irrigated if it is a dry year or pumped of excess water if it is a wet year to improve the habitat for Belding's savannah sparrow. This water management during construction would partially offset the territories lost due to grading in the full tidal basin. However, the loss of breeding habitat would remain significant during and immediately after construction.

Over the long term, this impact would be mitigated due to the enhanced pickleweed habitat in the muted and full tidal areas. The long-term effect of the project would be beneficial to this species (Class IV).

Construction during the breeding season could potentially disturb or damage nests of the federally threatened western snowy plover. Nest locations would be flagged or fenced. No construction would occur within 100 feet of a nest. Biological monitors would be onsite during the breeding season and all construction personnel would attend an educational program on threatened and endangered species. These measures would ensure that construction impacts to the western snowy plover would be insignificant (Class III).

Although no eligible cultural resources have been found within the project area, there is a slight chance a previously unknown cultural resources could be discovered during construction (Class III). Archaeological monitors would be present during construction and if cultural resources were uncovered proper procedures would be followed to reduce impacts to insignificant (Class III).

Beach areas about 800 feet north and south of the proposed tidal inlet would be closed to public access during construction of the PCH bridge and tidal inlet. This closure could result in long-term, temporary, significant, adverse (Class II) land use and (Class I) recreation impacts affecting use of the beach during summer holidays and weekends. Other adjacent land uses would not be significantly affected by project construction activities (Class III). During all phases of construction, public safety would be protected by use of barriers, signs, flagmen, and fences where applicable; therefore, no significant, adverse (Class III) impacts would occur.

Inlet construction would result in a temporary loss of surfing use at Lots 14 and 15, and would constrain the already heavily used Lots 23 and 24, resulting in a temporary, significant, adverse (Class I) impact during all four seasons.

Heavy equipment working in the Lowlands would be visible to those with views of the area. Most of the construction activity would occur to the viewer as an element in the middle ground to background of the viewshed and would not be a prominent visual feature, nor substantially change the overall character of the Lowlands. This is considered an adverse but insignificant (Class III) impact for the duration of construction. The most prominent visual activity would be the work at Staging Area 1a for construction of the PCH bridge and tidal inlet. The construction effort would temporarily degrade the character of the site, resulting in a temporary, significant, adverse (Class I) impact. Night lighting for project construction would not result in significant, adverse (Class III) impacts.

Traffic issues from project construction involve potentially significant impacts (Class II) from possible conflicts and safety concerns between construction traffic and local traffic using Seapoint Avenue, and conflicting turning movements at the PCH staging area. An access plan and traffic control plan should be implemented to reduce potential conflicts to insignificant. The Proposed Project would not have a significant, adverse impact (Class III)

on roadway segments during construction, and no significant, adverse impacts (Class III) to traffic flow are expected during PCH bridge construction. Project traffic is considered to be an adverse but insignificant (Class III) impact at area intersections.

Construction-related exhaust, dust, and asphalt emissions are anticipated from the Proposed Project. Exhaust emissions would be produced by heavy equipment, truck haul trips, and worker commutes. Nitrogen oxide (NO_X) from exhaust emissions is expected to exceed both the daily and quarterly criteria during construction, resulting in a significant, adverse impact (Class I). Demolition of existing structures and soil disturbance would create dust emissions. Dust emissions from the Proposed Project are considered a significant, adverse (Class II) impact. The application of asphalt during construction could release reactive organic gas (ROG) emissions. ROG emissions would not exceed impact thresholds and impacts would be insignificant (Class III).

The transport of workers, construction equipment, and materials to the site would incrementally increase noise levels on access roads surrounding the site. An adverse but insignificant (Class III) impact would occur on major routes, while a significant, adverse impact (Class II) would occur on local access roads immediately adjacent to the site.

Noise would be generated onsite during site preparation, grading, and construction. Compliance with County of Orange noise standards and the City of Huntington Beach Noise Control Ordinance would ensure that any onsite construction noise impacts would remain insignificant (Class III). Project construction is specifically scheduled around the breeding and nesting seasons of sensitive animal species to avoid any significant noise impacts (Class III). Phase II construction would also result in insignificant (Class III) noise impacts.

The project would not result in significant, adverse impacts (Class III) to energy consumption. Fossil fuel use associated with construction of the project would result in consumption of less than one-half of 1 percent of the total regional fuel demand, and consumption of electricity would not exceed available resources.

Temporary water and electric utility services would be required at one or more of the construction staging areas. Utilities are currently available onsite and the use of those utilities would be an insignificant (Class III) impact. The project would have insignificant impacts (Class III) on other public services, such as solid waste disposal, fire protection, police protection, and vector control.

Operational Impacts:

Pre-fill of the ebb bar with material dredged from the full tidal basin, combined with a beach monitoring and maintenance program, would prevent significant beach erosion during Phase I (Class III). However, when the future full tidal basin is opened during Phase II, the increased tidal prism would cause more sand to be lost to the ebb bar. To prevent the loss of beach sand, about 410,400 cy of material would be dredged from an offshore borrow

site and discharged at the ebb bar. Discharge of sediment at the ebb bar could have a temporary significant adverse impact on water quality (Class I).

Introduction of tidal flows to the Lowlands could cause groundwater levels in the residential area adjacent to the Lowlands to rise and the groundwater to become more saline (Class II). The proposed dewatering trench (French drain) would be installed to reduce impacts to groundwater to insignificant. However, additional analysis is needed to determine the exact design needed to effectively manage groundwater levels.

The construction of a tidal inlet would make the Bolsa Chica wetlands vulnerable to an offshore oil spill (Class I).

Tidal inundation around the edges of Rabbit Island could result in a loss of coastal woolly-heads. Although this plant is not on federal or state lists of protected species, the Rabbit Island population of coastal woolly-heads is sensitive because it is 1 of only 10 populations known to occur in the mainland United States (Class II). Several sensitive insect species and the silvery legless lizard would also be affected by loss of part of Rabbit Island. Because the insects and lizard are most closely associated with the dune habitat in the center of Rabbit Island, which would be least affected by tidal flows, and because all of these sensitive species are present in dunes along Bolsa Bay, these impacts would be adverse but insignificant (Class III). Except for possible impacts to the coastal woolly-head, loss of part of the Rabbit Island's environmentally sensitive habitat area (ESHA) to tidal wetlands, a more valuable habitat, is considered insignificant (Class III).

The part of the eucalyptus grove ESHA within the Bolsa Pocket could be damaged by the introduction of muted tidal flows. The eucalyptus trees provide valuable habitat for a variety of raptors. The loss of a small portion of the eucalyptus grove is considered an adverse but insignificant impact because eucalyptus trees on Bolsa Mesa would be preserved (Class III). Very few living trees are found in the Pocket but saltier groundwater could potentially harm the handful of trees growing on the edge of adjacent higher ground.

The Proposed Project would include regular beach nourishment at approximately 2-year intervals. Placement of sand in the surf zone during maintenance dredging may interfere with the spawning of California grunion (Class II). Spawning occurs during nighttime high tides between March and August.

Construction of the proposed tidal inlet would result in the permanent loss of beach as a result of land to water conversion. This impact would be adverse but insignificant (Class III). The continuity of the beach would be broken and would affect beach users traversing the length of the beach. Access across the inlet would be provided on the PCH bridge via a pedestrian access crossing, reducing the impact of breaking beach continuity to adverse but insignificant (Class III). The surfing experience would change as a result of construction of the tidal inlet. This difference would be perceived in different ways and would result in adverse but insignificant (Class III) impacts because some surfers would view the change as beneficial and some would not.

The project is compatible, from a land use perspective, with adjacent existing and future planned uses. No significant, adverse (Class III) policy impacts would occur. A potentially significant (Class II) safety issue may result if persons stray too close to the jetties. Situations that may result in injury include persons being washed off of or falling from the jetties, or getting swept into the inlet. Warning signs and lifeguard stations would be provided near the tidal inlet to reduce impacts to insignificant.

The new PCH bridge over the tidal inlet would change the character of the beach area when it is converted to this new use. Visually, there should not be a negative impression. Therefore, the new bridge would cause no significant, adverse visual impacts (Class III).

Post-construction traffic activity would be similar to that of year 2002 traffic without cumulative traffic or project traffic added. Operations would include infrequent maintenance, and traffic impacts would be adverse but insignificant (Class III). In the year 2002 cumulative project scenario, four intersections would operate at level of service (LOS) E. This cumulative condition would result in a significant, adverse (Class II) impact. The project contributes incrementally, but insignificantly, to the cumulative impact.

Following construction, minor air emissions may result from French drain operations and maintenance dredging. Operation of the French drain would consume electricity and would contribute a small amount of emissions associated with the production of electricity. Emissions associated with the generation of electricity are considered insignificant (Class III). Maintenance dredging may be required to keep the tidal inlet clear and would result in significant, adverse impacts to air quality (Class II).

Post-construction monitoring and maintenance would not result in a significant number of additional vehicle trips to the site and would not change vehicle-generated noise levels in the project area, an insignificant (Class III) impact. Operation of the French drain may require the use of pumps; however, the pumps would not be audible at any offsite locations. Therefore, insignificant, adverse (Class III) noise impacts would result. Maintenance dredging would not cause any significant, adverse noise impacts (Class III) if restricted to the hours of 7:00 a.m. to 10:00 p.m.

3. Long-Term Management. The consistency determination examines the proposed long-term management of the restored wetland complex:

Title to any properties acquired in the Bolsa Chica Lowlands for the Project will be held by the SLC. Pursuant to Section 1(d) of the Interagency Agreement, the SLC shall hold all lands so acquired "... in public trust ... for the purposes of ecological restoration and preservation, scientific study, open space, and fish and wildlife habitat protection."

Section 7(a) of the Interagency Agreement then makes the SLC responsible for effecting the Restoration O & M and Management Components of the Project (i.e., for

carrying out the long-term operation and management of the Project). The Agreement acknowledges, however, that the SLC may enter into an agreement with another agency or entity for this purpose. In this regard, the CDFG and the Service have a "first right of refusal" to enter into an agreement to manage the Lowlands on the SLC's behalf. If the Service should ultimately enter into such an agreement, then the lands acquired for the Project will be managed by the Service as a unit of the National Wildlife Refuge System (see Section 7(c) of the Agreement). If the CDFG should ultimately enter into such an agreement, the new lands would be added to the existing Ecological Reserve which they manage.

4. Schedule and Budget. The consistency determination includes discussion regarding the construction schedule:

Construction would occur in four phases (see FEIR/EIS Figures 2-19A and B) and would avoid or minimize impacts to fish and wildlife resources. The FEIR/EIS Environmental Constraint figure 2-20 is attached. Phase 1 (September-March) includes clearing and grubbing the full tidal basin, west half bridge and PCH detour construction, inlet construction begins. Phase 2A (March to September) includes completion of PCH bridge, levees and revetments of the full tidal basin, the French drain, cordgrass shelf, and preparations to begin dredging in the full tidal basin. Phase 2B includes dredging the full tidal basin, pre-filling the ebb shoal, constructing inlet jetties, PCH revetments, and nesting areas. Phase 3 includes muted tidal area culverts, salvage revegetation, and removal of some staging areas. Phase 4 includes completion of dredging, if necessary, opening of the inlet, and demobilization of construction equipment. See Chapter 2 of the FEIR/EIS for a more complete description.

The consistency determination states that construction of the proposed project would take approximately three years.

The current estimates of the incurred costs, future costs, and currently available funds for the proposed project are outlined in the consistency determination as follows:

EXPENDED	
Purchase of KREG property	*$25,000,000*
EIR/EIS & prelim. engineering	*2,400,000*
Contaminants Sampling and EcoRisk Assessment	*6,000,000*
SET ASIDE FOR FUTURE USE	
Future Full Tidal Restoration Account	*1,800,000*
Maintenance Account (long-term O&M)	*6,200,000*
FUNDS CURRENTLY AVAILABLE	
Wetlands Restoration Account	*53,000,000*
(Other funds only for Fieldstone Acquisition	*1,200,000)*
ACTIONS YET TO BE TAKEN	
Oil buyout and well removal in tidal basin	*8,000,000*

Final design and project management	*9,400,000*
Proposed Project Construction Cost (Dec. 99 est.)	*53,700,000*

Based on these estimates the potential "shortfall" may be as much as $18,000,000. The construction cost estimate will be updated, but the actual cost of construction will be better known after final design is completed and once the actual construction bids are opened. The construction cost estimate also includes a 20% contingency cost. Also, obtaining commitments for additional funds, at this time, is made more difficult by the fact that there is no actual shortfall of funds at this time.

The consistency determination also states that:

Funding for the long-term operation and maintenance of the Project is assured through the creation of a $5 million Maintenance Account, which will be held by the SLC (See Section 13(c) of the Interagency Agreement). The investment earnings from this principal account will be available only for annual expenses, with the first "expense" being a requirement to reinvest a sufficient amount to offset the effects of inflation.

D. **Status of Oilfield Cleanup and Ecological Risk Assessment.** The consistency determination addresses oilfield contamination and cleanup and the Ecological Risk Assessment for the Bolsa Chica Lowlands:

Five decades of oilfield operations in the lowland have contributed some degree of contamination in the sediments of the wetlands and the network of oil well pads, sumps, and roads. When the 880-acre property was acquired by the State in 1997, a voluntary cleanup agreement was executed with the Responsible Parties (oil companies and the seller). In this agreement, the Project assumed responsibility to characterize the nature and extent of contamination, identify contaminant threats to natural resources, determine the appropriate cleanup criteria for the site, and determine areas to be cleaned up. The Fish and Wildlife Service has the lead role in the Risk Assessment phase which includes completing the biotic, water and sediment sampling and preparing an Ecological Risk Assessment (ERA). The ERA will integrate the sampling results with the known wildlife use of the site and estimate the type and amount of contaminant exposure risk to fish and wildlife. This information will be used to develop clean-up criteria which, once implemented, will result in an acceptable or minimal contaminant exposure to wildlife subsequently using the site. The Responsible Parties will then prepare and execute a cleanup plan at their expense. Verification sampling is to be conducted after cleanup to verify that the desired levels of cleanup have been attained. The Regional Water Quality Control Board has approval and oversight of the cleanup plan, with funding support from an EPA grant. EPA is to supplement the ERA with its evaluation of whether risks to human health warrant additional response actions.

The sampling to characterize the nature and extent of contamination is almost complete and results are presented in a draft ERA document that will be completed and made public after review by the responsible parties. The discussions with the oil company and former owner

of the property are under way to determine the cleanup levels and cleanup plan.

Until the cleanup levels and plan are adopted, specific or quantified cleanup actions cannot be defined. However, closure of wells and cleanup in the vicinity of wells is not expected to be in dispute and has been conducted by the Lease Holder, AERA Energy, on their own schedule for the last several years pursuant to their lease agreement with the Landowner. Contaminants warranting cleanup beyond the vicinity of active and idle wellheads are the principal focus of the ERA and cleanup plan. Some generalized cleanup methods can be described: safely sequestered contaminants may be left in place, stable contaminants may be sequestered in constructed fills within the restoration project (e.g. berms), contaminated sediments may be hauled to appropriate landfill sites, or "landfarming" treatment techniques may be used within the lowland. The volumes of dirt requiring treatment or disposal handling different from that shown for the restoration project alternatives are unknown at this time. If the cleanup plan proposed by the responsible parties entails substantial changes to the habitat restoration project and its associated impact evaluation, a supplemental environmental analysis may be necessary.

The oilfield cleanup work addressed by the ERA will require the leaseholder to obtain a U.S. Army Corps of Engineers Section 404 (Clean Water Act) permit and may require a coastal development permit from the Commission. In addition, the Service states in the Final EIR/EIS and in the consistency determination that no restoration work or exposure of land to tidal action will occur until the oilfield cleanup activity is complete and verified.

II. Status of Local Coastal Program.

The standard of review for federal consistency determinations is the policies of Chapter 3 of the Coastal Act, and not the Local Coastal Program (LCP) of the affected area. If the LCP has been certified by the Commission and incorporated into the CCMP, it can provide guidance in applying Chapter 3 policies in light of local circumstances. If the LCP has not been incorporated into the CCMP, it cannot be used to guide the Commission's decision, but it can be used as background information. The Bolsa Chica LCP has **not** been certified by the Commission nor incorporated into the CCMP.

Port funds must be used for public trust purposes. Thus, because the ports funded the acquisition of the lowland property by the State Lands Commission, those lands were impressed with the public trust at the time they were acquired by the State, and no amendment to the LCP is required. Under Public Resources Code Section 30519(b), the Commission (rather than the County of Orange) has the authority to issue coastal development permits for development undertaken on public trust lands. In the event the Commission receives such an application, the standard of review will be Chapter 3 of the Coastal Act and not the certified Bolsa Chica LCP. The balance of the land in the area within the Bolsa Chica LCP that is not acquired by the State using port funds will remain subject to the County's jurisdiction if there is a certified LCP, or the Commission's jurisdiction in the absence of a certified LCP.

III. Federal Agency's Consistency Determination.

The U.S. Fish and Wildlife Service has determined the project consistent to the maximum extent practicable with the California Coastal Management Program.

IV. Coastal Act Issue Analysis. As noted previously, this staff report does not contain a recommendation for Commission action on the consistency determination, and accordingly, does not contain proposed findings to support a recommendation. Instead, the following sections contain only a preliminary analysis of the project with relevant Coastal Act policies.

A. DREDGING AND FILLING. The Coastal Act provides:

> **Section 30233**
>
> *(a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:*
>
> *. . .*
>
> *(7) Restoration purposes.*
>
> *(8) Nature study, aquaculture, or similar resource dependent activities.*
>
> *(b) Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation. Dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable long shore current systems.*
>
> *(c) In addition to the other provisions of this section, diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary. Any alteration of coastal wetlands identified by the Department of Fish and Game, including, but not limited to, the l9 coastal wetlands identified in its report entitled, "Acquisition Priorities for the Coastal Wetlands of California", shall be limited to very minor incidental public facilities, restorative measures, nature study, commercial fishing facilities in Bodega Bay, and development in already developed parts of south San Diego Bay, if otherwise in accordance with this division. . . .*

As described in above Section I-C-1 of this report, the proposed wetland restoration involves dredging approximately 2.7 million cu.yds. of material from the Lowlands to create a tidal basin and ocean inlet, placing a portion of the dredged material in the Lowlands to create a berm around the basin and to construct nesting islands, disposing dredged materials in ocean waters to pre-fill the offshore ebb bar and to pre-nourish the beach downcoast of the ocean inlet, and dredging sandy materials from an offshore borrow site to expand the ebb shoal during Phase 2 of the project (Future Full Tidal Area). These activities need to be examined for consistency with Section 30233 of the Coastal Act. Under this section, dredging and disposal within wetlands, estuaries, and open coastal waters is limited to those cases where the proposed project is an

allowable use, is the least damaging alternative, and where mitigation measures have been provided to minimize environmental impacts.

The allowable use test is met because the aforementioned dredging and disposal activities would be performed for habitat restoration purposes, an allowable use under Section 30233(a)(7).

The second test requires the Commission to examine whether the proposed project is the least environmentally damaging feasible alternative. The Service provided detailed analysis in the Final EIR/EIS of numerous wetland restoration alternatives to the proposed project (the Concept Plan without the flood control channel diversion structure). Those alternatives are referenced in the consistency determination and are summarized below:

1st Sub-Alternative: Restoration of Future Full Tidal Basin Concurrently with Phase I Restoration. This alternative is identical to the proposed project but would in addition restore the Phase II future full tidal basin in the northeast corner of the Bolsa Lowlands concurrently with restoration of the rest of the Lowlands rather than in 15 or 20 years when oil operations are completed.

2nd Sub-Alternative: Concurrent Restoration of Expanded Future Full Tidal Basin. This alternative is identical to the 1st Sub-Alternative but the future full tidal basin area would be dredged to increase the area of intertidal habitat.

Alternative 1: Flood Control Channel Routed into the Concept Plan Full Tidal Basin. This alternative would be the same as the Concept Plan but with all flows from the EGGW Flood Control Channel routed into the full tidal basin (**Exhibit 6**).

Alternative 2: Full Tidal Basin with a New Ocean Inlet near Rabbit Island. This alternative would create a full tidal basin and managed tidal areas similar to the Concept Plan but with a new ocean inlet near Rabbit Island where the EGGW Flood Control Channel discharges into Outer Bolsa Bay (**Exhibit 7**).

Alternative 3: Full Tidal Basin with an Ocean Inlet near Warner Avenue. This alternative would introduce tidal flows to the Concept Plan alternative through a new ocean inlet near Warner Avenue (**Exhibit 8**).

Alternative 4: Three Jetty Plan. With this alternative, a tidal inlet to the wetlands would be constructed near Rabbit Island and a separate inlet for discharge of flows would be constructed from the EGGW Flood Control Channel parallel to the inlet to the wetlands (**Exhibit 9**).

Alternative 5: Irrigation/Water Management. Minor modifications would be done to existing conditions to permit brackish water ponds to persist year-round. Water would be pumped between cells to prevent water levels from becoming too high or too low (**Exhibit 10**).

Alternative 6: The Concept Plan. This plan is identical to the proposed project, except that a side weir would be installed into the levee of the EGGW Flood Control Channel to allow spillover of a portion of the 100-year peak flood discharge into the full tidal basin. Storm flows would be conveyed to outer Bolsa Bay and the restored wetlands via the EGGW Channel; flows from the channel would begin to spill into the full tidal basin during a 10-year storm (**Exhibit 11**).

No Action Alternative. Nothing would be done to alter the water regime within the Lowlands.

The Final EIR/EIS also examined three alternatives which received additional analysis to determine their technical and economic feasibility prior to elimination from further detailed analysis:

Full Tidal Basin with Culverts and No New Inlet. This alternative would seek to restore a habitat mix similar to the Concept Plan by the construction of a series of large culverts running beneath PCH and the beach to connect the wetland to the ocean at the southern portion of the project area.

Small Area of Full Tidal with Huntington Harbour Connection and No New Inlet. This alternative would create full tidal expansion in the Pocket and Old Slough, widen the Warner Avenue opening to increase water supply through Huntington Harbour, dredge Outer Bolsa Bay, and discharge the EGGW Flood Control Channel directly into the Pocket full tidal basin.

Concept Plan with Discharge of Low Flows into the Wetlands. This alternative would split the flow from the EGGW Flood Control Channel to allow low flows to discharge to the wetlands and storm flows to bypass the wetlands and discharge into Outer Bolsa Bay.

Finally, the Final EIR/EIS reported on two project alternatives which were examined but eliminated from further detailed analysis:

Full Tidal Basin with Meandering Inlet. This alternative would include a habitat mix similar to the Concept Plan but tidal influence would occur through creation of a 1,000-foot-long causeway supporting PCH with no jetty structures for stabilization. This wide opening would allow the tidal channel connecting the tidal basin to the ocean to meander within the 1,000-foot opening to the ocean.

Orange County Coequal Plan. With this alternative, a new tidal basin would be constructed in the central Lowlands and would introduce tidal flow through construction of a new ocean inlet near Huntington Mesa. All flood control channel waters would be diverted into the new tidal basin. Additional habitats would include muted tidal and seasonal ponds. The area near the northeast boundary would be managed by freshwater irrigation.

The Service addresses in its consistency determination the project alternatives and its selection of the proposed project:

> *The selection of the Proposed Project was based on two considerations. The first consideration was the lesser extent of significant, adverse impacts that would result from project implementation. The second consideration was the extent to which wetland function and values within the Bolsa Lowlands would be improved, i.e., the ability of the selected alternative to meet the project purpose and need.*
>
> *Of the project alternatives analyzed in detail, Alternative 5 had the fewest adverse impacts because it would involve minimal construction. Also, because no tidal inlet would be constructed for Alternative 5, it would avoid the significant, adverse impacts to water quality, recreation, and land use from construction of the tidal inlet and pre-fill of the ebb bar at Bolsa Chica State Beach. However, Alternative 5 provided by far the lowest habitat benefits of the restoration alternatives. Alternative 5 would provide no benefits to marine fishes such as California halibut and may even be detrimental to marine fishes that would enter the Lowlands during the limited periods of tidal action. Alternative 5 would enhance the pickleweed vegetation in the Lowlands by providing periodic tidal flow but probably would not increase the diversity of wetlands vegetation. Specifically, no cordgrass would become established in the Lowlands if Alternative 5 were selected. Because no cordgrass would become established in the Lowlands with Alternative 5, no habitat would be provided for the endangered light-footed clapper rail. Alternative 5 would provide only a slight enhancement of overwintering habitat for migratory shorebirds, seabirds, and waterfowl. Foraging opportunities for the endangered California least tern and other tern and gull species would be only marginally increased. Furthermore, Alternative 5 would be expected to create more problems for Vector Control than the existing condition (Class III). In contrast, the tidal inlet alternatives would be less conducive to mosquitoes than the existing condition.*
>
> *All of the tidal inlet alternatives would provide similar habitat benefits including:*
>
> 1. *increased quality and quantity of open water and intertidal mudflat habitats for migratory shorebirds, seabirds, and waterfowl;*
> 2. *a healthy and diverse aquatic community of marine and estuarine invertebrates and fishes including nursery habitat for the California halibut;*
> 3. *increased nesting habitat and foraging opportunities for the state- and federal-listed endangered California least tern and the federal-listed threatened western snowy plover, as well as a variety of other water-associated birds;*
> 4. *expansion of cordgrass habitat to support nesting by the state and federal-listed endangered light-footed clapper rail; and*
> 5. *enhancement of pickleweed saltmarsh habitat that would expand nesting territories of the state-listed endangered Belding's savannah sparrow.*
>
> *Of all the restoration alternatives, the Proposed Project would provide the highest*

quality environment for aquatic fish and invertebrates because the EGGW Flood Control Channel would not discharge into the full tidal basin. Therefore, the disturbance to the aquatic community from the freshwater influx and pollutants during storm flows would not occur.

Because the Proposed Project would have no discharges from the EGGW Flood Control Channel, metals and bacteria would not be carried into the wetlands and the ocean. All of the other tidal inlet alternatives would have a significant, unmitigable, adverse impact to water quality in the wetlands and coastal waters from pollutants in storm flows (Class I). Bacteria in ocean waters would exceed thresholds and swimming and surfing would be restricted. Loss of swimming and surfing use of ocean waters during periods when bacteria exceeded threshold levels would be an unmitigable, significant, adverse impact to recreation (Class I).

The Proposed Project also would not result in the permanent loss of beach parking spaces that would occur with Alternatives 2, 3, and 4. The loss of parking spaces is a significant but mitigable impact (Class II). The Proposed Project would have a significant, unmitigable impact to surfing during project construction (Class I) that would not occur for Alternatives 2 and 4. However, construction impacts to surfing would be temporary. The Proposed Project was selected as preferred because it would provide much greater habitat benefits than Alternative 5, and would avoid the unmitigable, significant, adverse impacts to water quality and recreation that would occur with the other tidal inlet alternatives. The greatest habitat benefits would occur if the Proposed Project were combined with the 2nd Sub-alternative. Habitat benefits would also be increased, but to a somewhat lesser extent, if the Proposed Project were combined with the 1st Sub-alternative. No additional significant, adverse impacts would occur with either of these sub-alternatives, although the potentially significant (Class II) impacts of excavation of an offshore borrow pit would occur at the same time as the Phase I construction impacts rather than 15 or 20 years in the future.

The proposed project appears to be the most environmentally beneficial and, overall, the least environmentally damaging feasible alternative to restore the Bolsa Chica Lowlands to tidal wetland function as envisioned in the 1996 Concept Plan and CD-115-96. The other alternatives, while technically feasible, would lead to significant adverse effects on coastal resources, particularly water quality and recreation, and/or would not provide the volume of seawater inundation necessary to restore the range and diversity of tidal wetland habitats and functional values across the Lowlands outlined in the 1996 Interagency Agreement.

However, and as discussed further in the sections below, the proposed project does hold the potential to generate significant adverse impacts on coastal resources at and adjacent to the project site, in particular on water quality and public access and recreation. The design elements and mitigation measures built into the project will minimize most of the potential adverse effects on coastal resources. But before the Commission can determine that the proposed project is in fact the least environmentally damaging feasible alternative and that additional mitigation measures are not necessary, additional information and analysis regarding dredged sediment

quality and nearshore disposal actions (as discussed below in Section D) must still be received from the Service.

B. SHORELINE STRUCTURES/COASTAL PROCESSES. The Coastal Act provides:

Section 30235

Revetments, breakwaters, groins, harbor channels, seawalls, cliff retaining walls, and other such construction that alters natural shoreline processes shall be permitted when required to serve coastal-dependent uses or to protect existing structures or public beaches in danger from erosion, and when designed to eliminate or mitigate adverse impacts on local shoreline sand supply. Existing marine structures causing water stagnation contributing to pollution problems and fish kills should be phased out or upgraded where feasible.

Section 30233(b)

Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation. Dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable long shore current systems.

1. Existing Environment. Bolsa Chica State Beach is a relatively wide sandy beach starting at the Anaheim jetties to the north, and ending at the Huntington Cliffs to the south. South of Huntington Cliffs is Huntington Beach City Beach. Much of the Bolsa Chica State Beach is 200-foot-wide or wider, with the beach width decreasing at the southern end, in the area of Huntington Cliffs. Beach width varies seasonally and fluctuations of the Mean Lower Low Water line can range from 50 to 150 feet within the Bolsa Chica area. The following table shows the average beach widths and seasonal variations for the alternative tidal inlet locations.

Typical Beach Widths and Seasonal Variability, Bolsa Chica State Beach

Location	Average Beach Width	Average Seasonal Beach Width Variability, At MSL Line
Warner Avenue	413	63
Rabbit Island	311	29
Concept Plan (proposed)	243	22

Historically the Santa Ana River provided sand for this beach area. The Anaheim Jetties were constructed in the 1940s and blocked the delivery of sediment from the Santa Ana River to this area. Since the construction of these jetties, the main source of new sand to these beaches has been from regular nourishment of the beaches at Surfside and Sunset beaches. Since 1945, over 16 million cubic yards have been placed on Surfside or Sunset beaches (DEIR, Table 3.2-6). As noted in the FEIR, this nourishment project "is an authorized project with an indefinite life and will remain authorized unless specifically acted upon by Congress. However, future beach nourishment stages will be dependent on funding contained in future federal energy and water

appropriations and from the State of California and local governments. If the Surfside/Sunset Beach nourishment program is terminated, sediment deficiency will be likely to occur for the entire coastal segment from Surfside/Sunset to West Newport Beach." (DEIR, Page 3-62)

Sediment transport along the beach at Bolsa Chica has a strong seasonal pattern. During the winter months, November to March, storms and swell from the west and northwest move sediment to the southeast. This trend is reversed in the summer months, May to October, when the swell comes from the south. The summer swell is typically milder than winter storms, resulting in net sediment transport to the southeast. The gross annual transport rate is about 300,000 cubic yards, and the net annual transport (to the southeast) is about 80,000 cubic yards.

The wave climate and offshore bathymetry at Bolsa Chica State Beach provides many opportunities for surfing, mostly from beach surf breaks. One spot, to the south of the project site, close to Huntington Cliffs has bathymetry that provides consistent wave focusing that provides more desirable surfing conditions. Along the rest of Bolsa Chica State Beach, the nearshore bottom is sandy and the preferred surf spots tend to vary up and down the shore, based on bottom conditions and the combination of wave direction and period. A surfer survey showed that the most crowded areas for surfing were near to Lots 14 and 15 (near the proposed tidal inlet) and Lots 23 and 24 (between Warner Blvd. and Rabbit Island). The DEIR noted, however, "no evidence of a specific nearshore bathymetric feature that produces a unique wave at any particular location," which is typical of beach break surfing areas.

2. Proposed Project. The proposed project will include construction of a tidal inlet across the sandy beach to develop tidal exchange between the ocean and the proposed full tidal wetlands (**Exhibits 12-14**). The main elements for this inlet will be:

- 420-foot-long, six-lane bridge (with two bike lanes) along Pacific Coast Highway;
- one 445-foot-long rip-rap rock jetty, with crest elevation of +13 MSL, extending to mean low tide;
- one 420-foot-long rip-rap rock jetty, with crest elevation of +13 MSL, extending to mean low tide;
- 1,400-foot-long (approximately) rip-rap rock revetment paralleling the highway;
- excavation of approximately five acres of beach to open the jetty inlet (190,000 cubic yards);
- non-navigable tidal inlet, approximately 360 feet wide (between crests of the jetties);
- pre-filled ebb tidal bar, created with approximately 1,331,000 cubic yards of sediment;
- advance downcoast nourishment with approximately 190,000 cubic yards of beach sand;
- six monitoring sites to measure complete profiles (to –40 feet MLLW) twice a year;
- regular dredging of the flood bar to maintain full tidal exchange; and
- regular nourishment of downcoast beaches, using sand dredged from the flood bar.

3. Phase 1 and Phase 2 Restoration. The restoration project will occur in two phases and the tidal inlet has been designed to handle the tidal exchange that will be needed for the full-tidal condition of Phase 1 and Phase 2. The most significant changes that will occur between Phase 1

and Phase 2 will be the increased tidal exchange, increased flows through the inlet, and the increased size of the ebb and flood tidal bars. The jetties and tidal inlet will be designed and built for the Phase 2 flow conditions. The ebb bar will be pre-filled to conform to the size and extent of the ebb bar that would be expected to develop for the Phase 1 tidal exchange conditions of each phase. The ebb bar will be constructed for Phase 1 conditions and later will be expanded for Phase 2. When the Phase 2 restoration is completed, the existing ebb bar will be artificially enlarged with additional nourishment material to match the new tidal exchange conditions.

4. Project Alternatives. Alternatives to the full tidal option are discussed above in Section A of this report. Options that would provide full tidal exchange are:

- the proposed inlet at the south end of the Bolsa Chica Ecological Area
- a new tidal inlet adjacent to Rabbit Island
- a new tidal inlet adjacent to Warner Avenue
- culverts connecting the ocean and the full tidal area

The historic inlet for this area (circa 1873) was Los Patos channel, near the northwest corner of Bolsa Chica Mesa, and closer to the proposed Warner Avenue inlet area. Many of the coastal impacts from a new tidal inlet will occur regardless of the location of the inlet. Shifting the inlet location will just shift the location of the impacts. Downcoast erosion is a possible adverse impact from any of the new inlets and ebb shoals. The Rabbit Island and Warner Avenue inlet locations would be further from the Huntington Cliffs than the proposed inlet location. Either of these inlet locations could reduce the potential for adverse impacts at Huntington Cliffs. However, due to the seasonal reversals in sediment transport, these inlet locations also could exacerbate erosion concerns at the Surfside/Sunset beaches.

The inlet designs will change slightly for the various inlet locations. The Warner Avenue location would not require any shoreline protection, due to the current width of the beach. But, since the beaches at Warner Avenue and Rabbit Island are wider than at the proposed inlet location, and since these beaches have greater seasonal variability, these sites would require longer jetties to maintain full tidal exchange. There will be small differences in impacts to coastal processes between the different inlet locations; in general, all three inlet locations pose the potential for comparable impacts from a coastal process perspective.

The option that would minimize impacts to coastal processes would be the use of culverts that would go beneath Pacific Coast Highway and the Bolsa Chica State Beach. The culvert option would entail use of a dozen 20-foot diameter culverts. The ocean end of culverts would have to extend beyond the zone of active sand transport to avoid being sanded in, so each culvert would have to be about 8,000’ long. It is questionable whether fish would use these culverts to travel into and out of the restored wetland. In addition, due to the size and length of the culverts, this option would cost between $150 and $200 million and could not be covered by the existing restoration budget.

5. Impacts from the Proposed Project and Efforts to Eliminate or Minimize Impacts.

(a) Loss of Beach. During construction of the Pacific Coast Highway Bridge, the jetties and the tidal inlet, public access to the work area will be restricted for public safety reasons. The restricted access region would be approximately 1,000 feet from the center of the inlet, in both directions, spanning 2,000 feet total. The average beach width in this location is about 243 feet, so the total area of temporarily lost beach access is about 486,000 square feet, or 11.2 acres. This temporary loss of beach access would last for about three years. Beaches up and down coast of the construction area would remain open for public access, although construction activities could reduce available parking and access to the beach from the Bolsa Chica State Park facilities. The only access for the public beaches south of the construction area will be to either walk 2,000 feet along the temporary bike path, or walk north from the City beach. No new temporary access will be provided to the beach south of the construction site.

After the construction phase is completed, access will be allowed again to the remaining beach areas. The revetments, the jetties and the tidal inlet will be permanent structures and will continue to occupy land that previously had been public beach. The jetties and tidal inlet are needed to maintain a stable tidal inlet, and they will permanently replace about five acres of beach.

The area of revetment encroachment has not been calculated since the revetment designs have not been finalized or provided. The proposed revetments, north and south of the tidal inlet, would total 1,400 feet. They would be immediately adjacent to the elevated roadbed of PCH and would be mostly covered by sand. The revetments are being proposed as a last line of defense to provide the minimum necessary protection for PCH and the State Parks parking lots from extreme beach retreat during a severe storm. Due to their location at the backshore, they should only interfere with coastal processes during extreme storm events. The Service did not consider any alternatives to the revetment, stating that this design is "the most effective at dissipating wave energy with minimum wave reflection and effects on adjacent shore." (September 20, 1995 Letter Report from Chris Webb, Moffatt & Nichol Engineers, to Mr. Ron Tibbets, County of Orange, Environmental Management Agency.)

The proposed project will result in permanent replacement of about five acres of beach with the jetties and tidal inlet. In addition, some of the structures, such as the revetments and the lower slopes of the outer sides of the jetties, will encroach onto the beach, but will be covered by sand under average, non-storm conditions. The Service considers these impacts to be permanent, unavoidable impacts. The Service is not proposing any mitigation for this permanent loss of beach area, or for the encroachment of structures that will be covered by sand during normal, non-storm conditions.

(b) Impacts to Coastal Processes. The major project features that may alter coastal processes will be the revetments, the jetties holding open the tidal inlet, and the dynamics of the tidal inlet and flood and ebb tidal bars. Each feature will affect coastal processes in different ways.

The Service has addressed impacts from revetment construction. The proposed revetments will be situated far back on the beach, at a location where they should only infrequently be affected by waves or be in a situation where they could alter or impact coastal processes. During these infrequent times, the impacts from the revetments could include scour, end effects, and fixing the back of the beach. The revetments are designed as a "last line of defense." As such, they could only infrequently be subject to wave action. However, during the times that they are subject to wave action, they would provide erosion protection for the support for the elevated roadbed and parking area from erosion and undercutting.

The proposed jetties will have greater and more regular impacts on shoreline processes than the revetments. The jetties will extend only to Mean Lower Low Water. This termination is being proposed so that there will be minimal interruption of longshore sediment transport and nearshore currents. A similar short jetty design was used for the recently constructed Talbert Channel and has been effective in minimizing interruption of longshore transport. Some small amount of accretion will occur upcoast of the jetties and some erosion would occur downcoast. Since the littoral transport shifts direction seasonally along this beach, the jetty impacts would be fairly small but would occur both north and south of the jetties. The Service's modeling efforts estimate that the jetties could cause up to 10 feet of erosion after they have been in place for five years, and could go up to 23 feet after 20 years.

The tidal inlet and ebb and flood tidal bars are likely to have the greatest impact on coastal processes. Under normal inlet conditions, the tidal flow in and out of the inlet will modify and interfere with both longshore currents and on-shore wave action. Flood and ebb shoals are features that develop at the ocean side (the ebb tidal bar) and the wetland side (the flood tidal bar) of most tidal inlets. For a stable inlet, the flood and ebb bars will eventually reach a state of dynamic equilibrium – growing larger and smaller to adjust to changes in tidal currents and wave climate. For a new inlet, the material that will create the ebb and flood bars will come from littoral sediment supplies and, absent mitigation, substantial downcoast erosion would occur as the ebb and flood bars become established. The ebb bar will also cause waves to break further offshore, on the shoal, and will modify and refocus local wave energy.

The size of the bars is dependent upon the tidal exchange and wave environment. For the ebb bar, once it reaches a stable size and volume, it will begin to by-pass material downcoast and a new "equilibrium" littoral transport system will develop. The equilibrium ebb bar for the Phase 1 effort is estimated to cover 1,960,000 square feet of nearshore area and require 623,000 cubic yards of sand, slightly coarser than the sands that currently exists in the nearshore area. It could take many years for the ebb bar to become completely established, but the shoal will grow quickly in the first few years, and more slowly thereafter.

It is anticipated that the flood shoal will trap 165,000 cubic yards of sand the first year, 134,000 cubic yards the second year, 64,000 cubic yards the third year, and only 10,000 cubic yards the fourth year. The equilibrium flood bar would cover 3,725,000 square feet and require 373,000 cubic yards of sand.

The 996,000 cubic yards of sand that would build the equilibrium ebb and flood bars, if taken from longshore sediment transport supplies, would result in significant erosion both north and south of the inlet. Using a conversion factor of 1.7 cubic yards of sand/square foot of dry beach, this could cause the erosion loss of 13.45 acres of dry beach north and south of the inlet.

The Service proposes several measures to avoid the erosive impacts of ebb and flood bar development. For the ebb bar, the applicant is proposing to construct or pre-fill the ebb bar for both Phase 1 and Phase 2 tidal conditions. The initial ebb bar will be constructed with 1,331,000 cubic yards of sediment that will be dredged from the tidal wetlands. During the Phase 2 project, over 400,000 cubic yards of sand will be added to the ebb bar to accommodate the increased tidal exchange that will occur with this part of the project.

The Service will also place 190,000 cubic yards of sand from the tidal inlet onto downcoast beaches as "advance fill" to offset the sand losses that are likely to occur when the flood shoal develops. The Service anticipates that the flood shoal will trap 165,000 cubic yards of sand the first year, 134,000 cubic yards the second year, 64,000 cubic yards the third year, and only 10,000 cubic yards the fourth year. The growth of the flood shoal will dampen the tidal exchange in the wetland, and to maintain full tidal action in the restored wetland area, the applicant proposes to dredge the flood shoal on a regular basis. The material dredged from the flood tidal bar will also be placed on downcoast beaches.

The intent of all these actions (pre-filling of the ebb bar, advance fill of the downcoast beaches, and routine nourishment of the downcoast beaches) is to minimize or eliminate any downcoast erosion from the tidal inlet. The Service estimates the new tidal inlet could cause over 100 feet of beach loss if no steps are taken to mitigate impacts from the jetties and inlet. With the pre-filled ebb bar and routine dredging of the flood bar, the project-induced impacts would result in about 7 feet of erosion in the first two years, but beach accretion by the fourth year of operation (7 feet in Year 4, 18 feet in Year 6, and up to 37 feet in Year 10).

(c) Possible resource impacts associated with the ebb tidal bar. The Service proposes to use 1,331,000 cubic yards of sediment to pre-fill the ebb bar. The sediment that will be used to construct the ebb bar will contain a high percentage of fines. Some samples have up to 40% fines; however the overall mix of sediment will contain slightly more than 20% fines. The 1,331,000 cubic yards of sediment on the ebb bar would provide an effective volume of 861,700 cubic yards of sandy bar material and 469,300 cubic yards of fines. The fines should be sorted by wave action and carried away from the bar; the Service anticipates that about half the fines would be lost immediately and the rest would be lost due to sediment sorting and selective transport.

Modeling for the ebb tidal bar has found that the Phase 1 ebb bar equilibrium volume is 623,000 cubic yards of sand. This is larger than the 861,700 cubic yard effective sand volume that will remain from the initial placement of 1,331,000 cubic yards of sediment. The Service has assumed that the excess bar material will function as nearshore nourishment and be beneficial to downcoast beaches. However, the Service has not provided information on the effects from this overfilling. Since the ebb bar will modify wave patterns and nearshore wave energy, the overfill

bar could result in a temporary increase in the area of beach influenced by the bar. The overfill could too add to the available nourishment volume and be beneficial to downcoast beaches. The impacts and benefits from this overfill are not fully known since the Service has, at the time of this writing, not been able to provide a complete quantitative analysis of these effects.

The general concept of pre-filling the ebb bar appears valid and should be quite beneficial in preventing some of the clear adverse impacts that could occur if the inlet were constructed and the ebb bar were allowed to form naturally. However, there are not many examples of new tidal inlets where the ebb bar was pre-filled. Commission staff has requested the Service to provide examples of other inlets where this has been done, but at the time of this writing, the Service has not been able to provide any such examples. This lack of prior experience does not negate the clear benefits that should occur from pre-filling, but rather that the ebb bar will need to be carefully surveyed and monitored to determine whether it is performing within the limits anticipated by the modeling. This monitoring can provide feedback on the utility of pre-filling the ebb bar and useful information to insure that the Phase 2 pre-filling is performed as well (or better) than the Phase 1 effort. At present, the Service has not provided information on experience with pre-filling other ebb bars or a plan for sufficient surveying or monitoring of the pre-filled ebb bar.

(d) Huntington Bluffs. The proposed inlet location is closer to the Huntington Bluffs than the other two alternatives. The cliffs are 3,000 feet to 7,000 south of the proposed inlet. In 1994, Moffatt & Nichol Engineers modeled the impacts of the proposed inlet to erosion at Huntington Cliffs. The analysis estimated that a beach width of 200 feet would be adequate to protect the back shore from erosion, but the beach at Huntington Cliffs is below this identified threshold. The analysis noted that Huntington Cliffs would be expected to erode approximately 60 feet in ten years without the project, and 65 feet in ten years with the project. The proposed project may increase erosion at Huntington Cliffs by up to 5 additional feet in 10 years (an 8% increase over background conditions).

Beach nourishment is the only erosion mitigation measure that the Service is proposing. Huntington Cliffs could be adversely impacted from both interruptions in local sediment supplies and modifications to local wave energy. The information from the Service indicates that beach nourishment will only occur when the tidal inlet needs to be dredged. If the tidal inlet is the component that determines when nourishment will occur, nourishment may not be undertaken frequently enough or in large enough volumes to completely mitigate for adverse impacts to Huntington Cliffs. Huntington Cliffs is the only location in the project area where excessive beach erosion could result in irreversible adverse impacts. In the rest of the project area, beach erosion would cause a loss of beach, but this could be corrected with sufficient nourishment. Bluffs cannot be restored with beach nourishment. The Service has not provided adequate information on erosion mitigation to provide assurance that nourishment will address the potential impacts to Huntington Cliffs. Due to the lack of information on efforts that could be taken to reduce the project-related impacts to Huntington Cliffs and the possible lack of monitoring information for the area of the cliffs, it is not possible to fully analyze the impacts of the proposed inlet to this area at this time.

(e) Monitoring and Mitigation for Beach Erosion. The Service has proposed to measure profiles at three locations north of the inlet and three locations south of the inlet. The locations that will be monitored are, from north to south: Warner Avenue, a site just north of the inlet, a site just south of the inlet, Huntington Pier, and two other locations that will be determined during the final design. The profiles would be measured spring and fall and would extend from a stable back beach location to –40 feet MLLW. In addition, the Corps of Engineers will collect monthly beach width data along the entire project area shoreline. The monitoring would be used to determine whether any beaches have eroded more than the range of seasonal fluctuation and if so, the inlet would be dredged and an appropriate quantity of sand would be placed on the eroding beach. The monitoring would not necessarily identify any changes to the backshore at locations such as Huntington Cliffs, although during final design the Service may decide to establish a profile location at Huntington Cliffs. Finally, the monitoring will not provide information on the performance of the pre-filled ebb bar. Some of the profiles could cross through the ebb bar; however, the Service has not proposed any monitoring that specifically addresses the bar. "As shoreline stability is the objective of the beach nourishment program, the project proposes to use coastline response as the data set for decision-making, not fluctuations in the ebb bar." (Responses to Coastal Commission Questions, Bolsa Chica Wetlands Restoration Project, provided July 24, 2001.)

Staff however, notes that since the bar will be again filled during Phase 2, monitoring of the bar following the pre-fill in Phase 1 could provide valuable information that would enhance the design and performance of the second ebb bar pre-fill. The Service has been asked to provide details on the monitoring program and to consider additions to the monitoring that would ensure it can provide useful project information. In response to this request, the Service has noted that the proposed monitoring should be sufficient to monitor project-induced effects and the efficiency of the beach nourishment program. Without further information on the final design of the monitoring program and the nourishment program, it is not possible at this time to analyze the effectiveness of these programs for identifying and either avoiding or minimizing all project-induced beach and bluff effects.

(f) Routine Nourishment. The Service has proposed to place material dredged from the flood shoal onto identified areas of eroding beach. The timing and method of this regular nourishment has not been identified, nor has the Service provided criteria for placement (other than by stating that those beaches that have narrowed more than their seasonal fluctuation would be addressed). The nourishment must be responsive to local conditions and to beach conditions at the time of the placement. However, nourishment can have local impacts to access and habitat (e.g., grunions). The Service has not provided sufficient information on this effort, and due to this lack of information, it is not possible at this time to analyze the impacts from this nourishment or to determine whether it will be performed in the least environmentally damaging manner.

(g) Sea Level Rise. The Commission staff examined the sea level change estimates used by the Service in their design of the wetland restoration project. The Service anticipated a rise of 0.9 feet in 100 years. This figure is somewhat lower than some environmental groups recommend, but is nevertheless a reasonable figure and within the accepted range of possible sea level rise scenarios.

(h) Conclusion. Many aspects of this project are being proposed to minimize or avoid impacts to adjacent beaches. However, at this time, additional information is needed before the Commission can determine the project's potential impacts on shoreline processes.

C. PUBLIC ACCESS AND RECREATION. The Coastal Act provides:

Section 30210

In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.

Section 30211

Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.

Section 30212

(a) Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects except where:

(1) It is inconsistent with public safety, military security needs, or the protection of fragile coastal resources,

(2) Adequate access exists nearby, or,

(3) Agriculture would be adversely affected. Dedicated accessway shall not be required to be opened to public use until a public agency or private association agrees to accept responsibility for maintenance and liability of the accessway. . . .

Section 30213

Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided. Developments providing public recreational opportunities are preferred. . . .

Section 30214

(a) The public access policies of this article shall be implemented in a manner that takes into account the need to regulate the time, place, and manner of public access depending on the facts and circumstances in each case including, but not limited to, the following:

(1) Topographic and geologic site characteristics.

(2) The capacity of the site to sustain use and at what level of intensity.

(3) The appropriateness of limiting public access to the right to pass and repass depending on such factors as the fragility of the natural resources in the area and the proximity of the access area to adjacent residential uses.

(4) The need to provide for the management of access areas so as to protect the privacy of adjacent property owners and to protect the aesthetic values of the area by providing for the collection of litter. . . .

Section 30220

Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.

Section 30221

Oceanfront land suitable for recreational use shall be protected for recreational use and development unless present and foreseeable future demand for public or commercial recreational activities that could be accommodated on the property is already adequately provided for in the area.

Section 30007.5

The Legislature further finds and recognizes that conflicts may occur between one or more policies of the division. The Legislature therefore declares that in carrying out the provisions of this division such conflicts be resolved in a manner which on balance is the most protective of significant coastal resources. In this context, the Legislature declares that broader policies which, for example, serve to concentrate development in close proximity to urban and employment centers may be more protective, overall, than specific wildlife habitat and other similar resource policies.

The Final EIR/EIS states that:

Bolsa Chica State Beach extends approximately six miles from Warner Avenue at the north end of the project area southward to the Huntington Beach Municipal Pier. . . . Recreational facilities are located along a three-mile northern segment of the beach and include 2,200 parking spaces, 100 camping spaces, five concession plazas, 550 fire rings/barbecue pits, 14 restrooms, 28 cold-water showers, and a handicapped access ramp across the sand. Parking along PCH was prohibited in 1981, and uncontrolled access to the beach was also precluded by fencing that runs the length of the state parking lot.

Approximately 3 to 4 million people currently visit Bolsa Chica State Beach annually. Based on daily parking and annual parking pass users, peak daily usage is approximately 65,000 people over the 2-mile stretch of Bolsa Chica State beach (Personal communication, D. Ito, 2000).

The consistency determination examines the expected impacts on access and recreation in the Lowlands and on Bolsa Chica State Beach as a result of the proposed project:

Beach areas about 800 feet north and south of the proposed tidal inlet [and the 400-foot-wide inlet corridor] *would be closed to public access during construction of the PCH bridge and tidal inlet. This closure could result in long-term, temporary, significant, adverse (Class II) land use and (Class I) recreation impacts affecting use of the beach during summer holidays and weekends. Other adjacent land uses would not be significantly affected by project construction activities (Class III). During all phases of construction, public safety would be protected by use of barriers, signs, flagmen, and fences where applicable; therefore, no significant, adverse (Class III) impacts would occur.* [In addition, the Service confirmed that the existing bicycle-pedestrian trail along Bolsa Chica State Beach will be maintained for public use throughout the three-year construction period via the PCH detour, and this trail will provide public access to that portion of the State Beach south of the inlet construction zone.]

Inlet construction would result in a temporary loss of surfing use at Lots 14 and 15, and would constrain the already heavily used Lots 23 and 24, resulting in a temporary, significant, adverse (Class I) impact during all four seasons.

Construction of the proposed tidal inlet would result in the permanent loss of beach as a result of land to water conversion. This impact would be adverse but insignificant (Class III). The continuity of the beach would be broken and would affect beach users traversing the length of the beach. Access across the inlet would be provided on the PCH bridge via a pedestrian access crossing, reducing the impact of breaking beach continuity to adverse but insignificant (Class III). The surfing experience would change as a result of construction of the tidal inlet. This difference would be perceived in different ways and would result in adverse but insignificant (Class III) impacts because some surfers would view the change as beneficial and some would not.

. . .

The existing loop trail and Ecological Reserve parking lots will remain. The existing trespass along the flood channel levees would continue, although measures to reduce damaging incursions into the lowland from this area will likely be implemented. The existing bicycle-pedestrian trail along the beach will be maintained by rerouting the trail across the inlet on a portion of the new bridge, separate from the PCH traffic lanes. This separate section of the bridge will also provide beach safety vehicle access across the inlet. Caltrans approved detours would maintain PCH traffic flow throughout construction. The existing exit from the beach park to PCH would be reconstructed. Temporary reduction in the number of parking slots on the State Beach due to inlet construction safety requirements will be insignificant, except on peak use days. (At this time, due to State Park's reconstruction of all the restrooms at Bolsa Chica State Beach, all restroom facilities have been replaced with portable toilets and about 1,300 parking slots are unavailable through the peak beach use months.) No beach facilities would be permanently reduced as a result of the Proposed Project.

Environmental interpretation and education and related public access and facilities will be

an integral part of later planning for the Project [**Exhibit 15**]. *The expected focus will be on suitability and location for trails and kiosks and seasonal protection of high bird use areas. The actual planning for interior trails and seasonal public access will be conducted by the long-term land manager after construction is complete, in consideration of sensitive wildlife uses and safe operation of continuing oil field operations. Potential connection to existing or proposed trail systems outside the Lowland must await consideration of those properties adjacent to the lowland. Improved public access connections to the State Beach may be considered at a future date, as well.*

The lowland Project area is not suitable for intensive recreational uses. The goal of the Project is to restore a currently degraded wetland ecosystem to a productive, biologically diverse ecosystem. As such, intensive recreational uses inside the wetland area would be in conflict with the goals of habitat restoration and wildlife conservation. After wetland restoration is complete, trails and interpretive kiosks will be considered as a means of meeting the proponent's environmental interpretation and fish and wildlife education missions, as well as, the public access and recreational policies of the California Coastal Act. Also, continued safe operation of a portion of the existing oil field is expected to preempt most public access in the south end of the lowland for many years.

Waterborne recreation will be considered only where consistent with the primary purposes of fish and wildlife resource conservation. The inlet channel and jetties are not intended to be navigable, but will be designed and implemented to retain and protect the existing recreational uses of the State Beach Park to the maximum extent possible. The inlet is expected to attract recreational fishing interest. The ebb shoal may create a more appealing surf break than currently exists, drawing more surfers to this section of beach than occurs now. Public access and State Beach safety and maintenance vehicle access would be retained across the inlet channel, separate from the Pacific Coast Highway bridges.

The construction of the inlet unavoidably requires the replacement of beach strand with an ocean connection. Just as the many acres of asphalt parking lot covering beach sand enables public access to the remaining sand, there must be an inlet across the beach to obtain the sought after biological improvements in the restored wetland. About 4 acres of ocean beach, lightly used by sunbathers except on peak use days would no longer be suitable for sunbathing purposes. This reduced recreational use would likely be offset as indicated above by other coastal recreational uses.

The proposed project will generate significant, adverse effects on public access and recreation, including surfing, at Bolsa Chica State Beach due primarily to the construction of the ocean inlet and the resultant loss of approximately five acres of sandy beach (**Exhibit 16**). While the project includes construction and post-construction mitigation measures (a pedestrian and bicycle bridge across the inlet) to minimize the disruption of lateral access along the shoreline due to the inlet, the loss of five acres of sandy beach to the approximately 400-foot-wide ocean inlet cannot be adequately mitigated. This element of the project is inconsistent with the aforementioned public access and recreation policies of the Coastal Act.

However, as noted elsewhere in this report, the construction of an ocean inlet is essential in order to restore full tidal function to the Bolsa Chica Lowlands. Restoration of the Lowlands with the ocean inlet will generate 366 acres of full tidal habitat and 200 acres of muted tidal habitat, protect 120 acres of existing seasonal pond habitat, and provide for a future full tidal habitat of 252 acres. The range of wetland habitats proposed for the Lowlands will also serve as mitigation for landfill construction in the Ports of Los Angeles and Long Beach, as provided for in the Interagency Agreement that led to the funding by the Ports of the purchase and restoration of the Lowlands. Commission concurrence with CD-115-96 (USFWS) for the Concept Plan for wetland restoration at Bolsa Chica and certification of port master plan amendments for landfill mitigation credits rested in part on the construction of the proposed ocean inlet to create full and muted tidal habitat in the Lowlands. Mitigation credits for landfill construction were released to the Ports in early 1997 after purchase and restoration funds were transferred to the State Lands Commission, and hundreds of acres of landfills have been or are presently under construction in both ports. Without construction of full and muted tidal wetlands in the Bolsa Chica Lowlands via an ocean inlet, the existing significant adverse effects on marine habitat and resources from port landfill construction would go unmitigated. Allowing this situation to occur would be inconsistent with the landfill and marine habitat mitigation policies of Section 30233(a) of the Coastal Act.

The Commission is then left with weighing these two Coastal Act inconsistencies – the absence of mitigation for the loss of four acres of sandy beach to the proposed ocean inlet and the loss of mitigation for 534 acres of marine habitat being filled in outer harbor waters within the ports. The project creates a conflict between the access and recreation policies of Chapter 3 of the Coastal Act on the one hand and the marine resource policies on the other. The wetland restoration and marine habitat benefits that would arise from the Bolsa Chica wetlands restoration project are hugely significant both on a regional and national scale. However, the access and recreation impacts, while significant and adverse, are nevertheless not as significant. The loss of five acres of sandy beach due to the 400-foot-wide inlet connecting the Lowlands and the Pacific Ocean must be evaluated in part within the context of the nine miles of public beach that stretch from Orange County's Sunset Beach (adjacent to the north end of Bolsa Chica State Beach) south through Huntington City and State Beaches and to the Santa Ana River jetties. Given the information contained in the consistency determination and the Final EIR/EIS, the proposed project would on balance be the most protective of coastal resources. The Commission should utilize the balancing provisions of Section 30007.5 of the Coastal Act in reviewing the proposed project due to the significant natural resource benefits that will arise from construction of an ocean inlet across Bolsa Chica State Beach.

D. WATER QUALITY. The Coastal Act provides:

Section 30230

Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

Section 30231

The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

Huntington Beach, to the south of the project site, has in recent years experienced persistent shoreline water quality problems due to several potential sources of contamination. Concerns have been raised over the potential for similar adverse water quality impacts along the Bolsa Chica shoreline as a result of proposed project construction activities, oilfield contamination clean-up, and the operation of restored tidal wetlands in the Bolsa Chica Lowlands, in particular the potential relation between wetland functions and bacterial contamination of nearshore coastal waters. This preliminary staff report examines this new issue and more routine water quality matters in the context of the proposed project.

1. Current Water Quality Conditions in the Lowlands and Immediate Offshore Waters. The Final EIR/EIS for the Bolsa Chica Lowlands Restoration Project states:

The Bolsa Chica Lowlands and wetlands are part of a semi-enclosed coastal body of water. Ocean Waters enter the system through Anaheim Bay, pass through Huntington Harbour, and enter Outer Bolsa Bay through a narrow channel under the Warner Avenue Bridge. Outer Bolsa Bay is the only area within the wetlands that has full tidal conditions. Tidal waters flow between Outer and Inner Bolsa Bay through tide gates that partially restrict tidal exchange. The tidal range of Inner Bolsa Bay is muted to about 22 percent of that of Outer Bolsa Bay. Water quality within Bolsa Bay is dependent on the quality of the water entering through Huntington Harbour.

Over the past century, the lowlands have been altered extensively by the construction of dikes, channels, tide gates, and roads; oil development; and agricultural and urban development in the surrounding area. The Lowlands consist of a series of diked, nontidal ponds landward of Bolsa Bay. Some of these ponds are connected by culverts and some are isolated. The amount of surface water in the Lowlands varies seasonally and with the amount of rainfall in a given year. In some areas, ponding of fresh water on saline soils has resulted in the creation of brackish water environments. The non-tidal areas are separated from Bolsa Bay by a dike built in 1978. Bolsa Bay and the Lowlands are an expansive complex of tidally influenced saltwater areas and perennial and seasonal brackish and freshwater areas.

Stormwater and urban runoff represent other input sources of waters into Bolsa Chica. The EGGW Flood Control Channel discharges stormwater runoff from the watershed into Outer Bolsa Bay through one-way flap gates. Urban runoff enters the Bolsa Chica

> *Lowlands from the Springdale Pump Station, which drains dry and wet weather runoff to Lake Signal and the Freemen Creek drainage. Additional urban runoff enters the Lowlands from Huntington Beach Mesa, particularly from the Seacliff culvert that drains water from a housing development and golf course onto the southern boundary of the site. Non-point source runoff from the Pacific Coast Highway (PCH) also may enter the site from along the western boundary. [EIR Vol. 1, 3.4.1, pages 3-38 and 3-39]*

To protect beach-goers from exposure to waterborne disease, a new state law (AB 411) mandates the implementation of recreational water quality monitoring programs at public beaches with 50,000 or more annual visitors. Specifically, the law requires monitoring for total coliform (TC), fecal coliform (FC), and the enterococcus (ENT) groups of bacteria, all of which may indicate the presence of fecal contamination. The state also enforces a set of uniform standards for TC, FC, and ENT bacteria including single-sample standards (10,000, 400, and 104 most probable number (MPN) or colony forming units (CFU)/100 mL), and 30 day geometric mean standards (1000, 200, and 35 MPN or CFU/100 mL); a lower single-sample standard for TC of 1,000 MPN or CFU/100 mL also applies when the TC/FC ratio falls below 10. The enterococci standard conforms closely to the national guidelines for marine water quality criteria published by the U.S. Environmental Protection Agency. If indicator bacteria levels in the ocean exceed any of the above standards, the local health officer is required to either post signs that warn against swimming in the water, or close the ocean to the public if a sewage spill is suspected. The state standards and U.S. Environmental Protection Agency guidelines are based on a series of epidemiological studies that link gastrointestinal illness and exposure to ocean water containing high levels of indicator bacteria, particularly ENT. The origin of ENT in these epidemiological studies was presumed to be anthropogenic sources of fecal pollution, such as sewage, agricultural runoff and urban runoff. (Above information from: Generation of Enterococci Bacteria in a Coastal Saltwater Marsh and Its Impact on Surf Zone Water Quality, S. Grant, et al., March 2001)

Daily to weekly monitoring for bacteria in the surf zone in the vicinity of Bolsa Chica is conducted by the County Sanitation Districts of Orange County, and reported to the County's public health department. On average, coliform densities at this location are within California Ocean Plan water contact standards during dry weather months; however, the standards are often exceeded after rains.

Regarding EGGW Flood Control Channel and offsite water flows into the Lowlands, the Final EIR/EIS for the Bolsa Chica Lowlands Restoration Project states:

> *The watershed surrounding the Bolsa Chica wetlands is occupied by a number of concrete flood control channels, primarily the EGGW/Oceanview Flood Control Channel system. This system collects and conveys runoff from a watershed of approximately 27 square miles northeast of Bolsa Chica that includes the cities of Huntington Beach, Fountain Valley, Westminster, Garden Grove, Santa Ana, Orange, and Anaheim. The watershed of the EGGW Flood Control channel is approximately 85 percent urbanized, and the remaining vacant and agricultural land is expected to be fully developed in the next 50 years. [EIR Vol. 1, 3.3.2.1, page 3-37]*

The EGGW Flood Control Channel receives flow from two upstream channels that originate in Garden Grove and Fountain Valley. In the project area, the main channel is unlined and runs through the northwest portion of the Lowlands. The channel terminates with one-way flap gates at the south end of Outer Bolsa Bay. From Outer Bolsa Bay, runoff is conveyed through Huntington Harbour, Anaheim Bay, and ultimately, to the Pacific Ocean. Except during and immediately following rainfall, flow in the EGGW Flood Control Channel is negligible. The EGGW Flood Control Channel is currently being upgraded to convey the 100-year storm. The improvements will occur over an extended period of time. [EIR Vol. 1, 3.3.2.1, page 3-37]

As discussed above, there is some limited uncontrolled flow into the Bolsa Chica Lowlands from Huntington Mesa. The remaining runoff from the Mesa is generally routed to the EGGW Flood Control Channel via the Slater Storm Channel and Slater Pump Station. [EIR Vol. 1, 3.3.2.1, page 3-37]

Immediately east of the Site, runoff from a 184-acre residential area, generally bounded by Whittford Lane, Halcroft Lane, and Central Park Drive is discharged into Freeman Creek through the Springdale (i.e., Bolsa Chica) pump station. [EIR Vol. 1, 3.3.2.2, page 3-38]

2. Water Quality Benefits and Improvements from the Proposed Project. The Final EIR/EIS for the Bolsa Chica Lowlands Restoration Project states:

The Project will result in the restoration and protection of environmentally sensitive habitat areas. The Project will provide for the retention and enhancement of existing fish and wildlife resources by reestablishing areas of full tidal influence in the wetland ecosystem. The new full tidal basin would occupy approximately 366.5 acres in the central Lowlands. Approximately 200 acres of additional Lowlands would be connected to the full tidal basin by culverts to establish a muted tidal area. Approximately 120 acres in the southeast area of the Lowlands would remain as seasonal ponds.

Water quality in the newly constructed full tidal basin is expected to be excellent. Full tidal flow would provide saline waters with nutrients and dissolved oxygen. Adequate tidal exchange would ensure water quality within the range of seawater. Residence time would be less than 1.5 days. Water temperature may increase due to the shallower depths of the wetlands compared to coastal waters; however, these increases would be slight due to the constant renewal by tidal flushing. Waters in the muted tidal basin would have less tidal flushing. Therefore, the range of water quality values in the muted tidal basin would be more extreme than that in the full tidal basin. [EIR Vol. 1, 4.4.2.1, page 4-40]

Water quality would be affected by several components of construction, including dredging to create the new basin, deposition of the resulting material in to the nearshore zone of the ocean, construction of an ocean inlet to the basin, and deposition of material from the inlet construction

onto the beach. Most of these impacts are related to temporary increases in turbidity resulting from these construction activities.

The Final EIR/EIS for the Bolsa Chica Lowlands Restoration Project states:

> *Resuspension and subsequent settling of fine particles in the dredged materials result in turbidity. Factors affecting the settling of suspended material include physical characteristics of the sediment (grain size, organic content, mineralogy) and chemical characteristics of the water (temperature, salinity, pH, and turbulence). Silts/clays remain in suspension longer than sands, high turbulence contributes to increased sediment resuspension, and high current speeds will transport turbidity plumes greater distances than low current speeds. [EIR Vol. 1, 4.4.2.1, page 4-37]*
>
> *Following dredging, the new tidal basin would be opened to the ocean via the new inlet. Turbidity within the new tidal basin, inlet and nearby coastal waters may be above background for a short time until fine sediment is flushed out. (Sediments with contaminant concentrations above screening levels would have already been removed, so resuspension of contaminants is unlikely). [EIR Vol. 1, 4.4.2.1, page 4-39]*
>
> *Increases in turbidity are expected in nearshore waters during prefilling of the ebb bar, and possibly during the construction of the inlet and placement of excavated material (from the inlet construction) on the beach. Turbidity plumes resulting from prefilling of the ebb bar would spread upcoast and downcoast via offshore currents. The distance and extent of the plumes would be determined by the actual grain size dredged, amount of silt/clays, production rate, and oceanographic conditions. For the most part, turbidity plumes would extend parallel to the shoreline given the predominant longshore current flows. However, this condition clears rapidly once the dredge discharge ceases. This activity would occur primarily during the fall and winter months, when turbid conditions commonly occur during rainfall events when river runoff spreads turbid water along the coast. [EIR Vol. 1, 4.4.2.1, page 4-37]*
>
> *Turbidity related to inlet construction and placement of excavated material on the beach is expected to be minimal and highly localized due to the low volume of material and the nature of the material itself (beach materials previously subjected to natural mixing and resuspension).*

3. Water Quality and Dredged Material Disposal. Approximately 1.33 million cu.yds. of material excavated and dredged from the Lowlands to create the tidal basin and ocean inlet will be disposed in the nearshore zone off Bolsa Chica State Beach, another 190,000 cu.yds. will be placed directly on the State Beach south of the ocean inlet, and approximately 822,000 cu.yds. would be placed within the Lowlands to construct levees and nesting islands. The potential impacts from disposal of this material on marine water quality include increased turbidity, placement of fines, reductions in dissolved oxygen, and potential resuspension of any chemical contaminants present in the dredged materials. These localized water column impacts will in turn affect fish and marine birds in the project area.

The Service has provided information on the volume of material available for different levels of fine material content. Of the 1,331,000 cubic yards of available sediment, 243,600 cubic yards has 30 to 40% fines, by volume. It appears, from the provided information, that the ebb bar could be pre-filled completely without using the material that has between 30 and 40% fines. The downcoast nourishment benefits may outweigh the impacts from placing a high volume of fine material in the nearshore environment. As of this writing, the Service has not provided information that allows a comparison of the different possible ebb bar designs or to determine the impacts from pre-filling the ebb tidal shoal as proposed by the Service.

While some information is provided on Phase 2, further shoreline analysis would be needed for this portion of the project once the Service can assure the time schedule for Phase 2 set-up and completion. Significant changes could occur to the shoreline from sea level rise, changes to the nourishment program at Surfside/Sunset, or other shoreline development not now anticipated. The monitoring for Phase 1 will provide information on shoreline conditions that will facilitate the development and analysis of options for Phase 2. The shoreline impacts for Phase 2 should be reanalyzed, and in more detail during any subsequent analysis of Phase 2.

The Service has provided information in the Draft and Final EIR that the main impact from placing a high volume of fines into the nearshore environment will be aesthetics. The sediment plume will definitely be visible while the ebb bar is being pre-filled, and for some undetermined period after construction is completed. The Service notes that the impacts from this project will be similar to the impacts from the beach nourishment projects that are undertaken regularly at Surfside/Sunset. However, the material used for nourishment at Surfside and Sunset usually has a fines content of 15% or less, where this project will have a much higher percentage of fines. Also, Surfside and Sunset are constructed as beach nourishment projects with controlling weirs and silt curtains to limit the concentration of fines in the runoff. The Service has not proposed any equivalent control features for the proposed project, and there are few possible turbidity controls for nearshore operations. At the same time, unlike Sunset/Surfside, the construction will occur during the winter months when there are often high background levels of fine sediments from coastal streams and rivers. The turbidity impacts from this project may be comparable to natural background levels.

The chemical analysis of the material to be used for the ebb bar show some samples that have slightly elevated concentrations of metals and other contaminants. The U.S. Environmental Protection Agency has noted that the Service has not performed sufficient sampling of the sediments within the restoration area and that toxicity and bio-accumulation testing should be performed to properly characterize project sediments. These sediments will be used to construct the restoration areas and the ebb tidal bar. The contaminant levels may be acceptable; however, the applicant has not finished the sampling and bioaccumulation testing that would be needed to determine the bioavailability of the sediments. The information is needed to analyze project impacts.

4. Water Quality and Bird Excrement. The Final Consistency Determination for the Bolsa Chica Lowlands Restoration Project states:

Due to the advent of AB 411 monitoring of surf zone bacteria and public warning thresholds in 1999, and the resultant series of beach warning postings and occasional closures in Huntington Beach centered around the Santa Ana River mouth and the sanitation district outfall discharges, water quality influences upon beach recreational uses have attracted much attention. It has been suggested by some that the creation of a new tidal inlet at Bolsa Chica would result in extensive beach closures such as those that have occurred in Huntington Beach. Large-scale and expensive studies have been undertaken by others to learn more about the situation in south Huntington Beach, such as, off-shore sampling to track sewer outfall discharges and thermal upwelling at the AES power plant cooling water discharge, and 24-hour bacterial sampling in the Santa Ana River and Newport Slough . To date, we have found no data or science based information that supports the view that tidal wetlands will cause chronic, wide-spread, or significant beach postings or closures. [The Final Consistency Determination for the Bolsa Chica Lowlands Restoration Project, 4.3, pages 34 through 37]

See **Appendix C**: "Generation of Enterococci Bacteria in a Coastal Saltwater Marsh and its Impact on Surf Zone Water Quality" by S.B. Grant, et al.

Substantial comments were submitted to the Service during the EIS/EIR comment period related to the potential bacterial contamination of nearshore waters. The Final EIR/EIS for the Bolsa Chica Lowlands Restoration Project analyzed and responded to these comments as follows:

Many commenters expressed a concern that even though the Proposed Project would not route the water from the EGGW Flood Control Channel through the new full tidal basin, bacteria generated by birds and other wildlife in the resultant wetlands might cause an exceedance of bacteria standards in the ocean. Several commenters suggested that the creation of a new tidal inlet at Bolsa Chica would result in extensive beach closures such as those that have occurred in Huntington Beach. The discharge from the Talbert Marsh was initially suspected as the cause for the Huntington Beach closures.

The results of the Huntington Beach water quality investigation became available in November 2000 and were reviewed by the preparers of this EIR/EIS. The Huntington Beach studies showed that the levels of bacteria generated within the marsh contributed to the bacteria problem, but were not sufficient, in and of themselves, to account for the problem itself. Specifically, the studies showed that bacteria generated by birds in Talbert Marsh could cause bacteria concentrations in the surf line near the marsh to briefly exceed criteria on outgoing nighttime or early morning tides. The study further concluded that fecal material deposited by western gulls is a significant source of indicator bacteria in the water flowing out of the Talbert Marsh and that indicator bacteria growing on vegetation in the marsh and in marsh sediments may also contribute to the nearshore loading of these microorganisms. The study additionally concluded that the levels of bacteria recorded along the beach were higher than could possibly have been generated by Talbert Marsh alone and that there has to be another source. Finally, the Talbert Marsh investigation included a study using a nearshore transport model

showing bacteria transport from Talbert Marsh along the shore. The modeling indicated that it is physically impossible for the levels of contamination measured at the beach to be caused by Talbert Marsh and the lower Santa Ana River/Newport Slough system combined. This result supports the hypothesis that another source must be involved.

These data suggest that bacteria within the wetlands at Talbert Marsh may cause bacteria standards to be exceeded in the ocean. However, the Talbert Marsh, with its large area of mud flat and small volume of open water, has a different configuration than many other coastal wetlands and the large full tidal basin that would be created at Bolsa Chica by the Proposed Project. In addition, Talbert Marsh supports an unusually high number of western gulls and to a lesser degree, elegant terns. The peak number of birds counted in Talbert Marsh during the Huntington Beach study ranged from 200 to 1,000 individuals, i.e. 8 to 40 birds per acre. It is expected that Bolsa Chica would not attract a high density of gulls such as does Talbert Marsh. Specifically, gulls are attracted to garbage and several garbage sources are found near Talbert Marsh, which is closer to developments than the Bolsa Lowlands. Gulls exploit these sources and then rest on the large amount of intertidal mudflat at Talbert Marsh.

A year's worth of detailed bird counts was done at Bolsa Chica (Guthrie et al. 1993). This study counted birds at Bolsa Chica every two weeks for a year in 1992 and 1993. The density of gulls and terns counted in this study in Inner and Outer Bolsa Bay would be expected to be representative of potential gull and tern density in the Bolsa Chica Lowlands when tidal flow is restored. Except for May, June and July, 1992, when the total number of gulls and terns in Bolsa Bay was as high as 865 because of a large number of terns nesting on islands in Inner Bolsa Bay, the total number of gulls and terns was always less than 250 and was as low as 10 in August of 1992.

Thus, the highest density of gulls and terns in the 175 acres of tidal wetlands in the Bolsa Chica Ecological Reserve was less than 5 gulls or terns per acre. Western gull numbers in all of Bolsa Chica never exceeded 11. The most abundant gull at Bolsa Chica was the smaller California gull. Numbers of gulls and terns in Bolsa Bay in excess of 100 was always recorded in Inner Bolsa Bay and was a result of nesting terns on the two tern islands. The highest density of gulls and terns in Outer Bolsa Bay, where there are intertidal mudflats where gulls could rest as they do at Talbert Marsh, was 15. The amount of feces and associated bacteria is directly proportional to the body weight of a bird. Thus, the fact that the birds that would be expected to occur in highest numbers at Bolsa Chica (terns, smaller gulls, ducks, shorebirds) are all smaller than and in less concentrations than the western gulls that occur in such high numbers at Talbert Marsh indicates that even less of a bacteria problem from wildlife would be expected at the Proposed Project.

Although close in proximity to Bolsa Chica, Talbert Marsh is not an appropriate comparison to the Proposed Project due to the variety of physical differences between the wetlands. Talbert Marsh is much smaller in size than Bolsa Chica, with one-fifth (20%) of the tidal prism and is, therefore, unable to dilute contaminants. The dilution that will

occur in Bolsa Chica is many times (approximately 5 times) greater than that occurring at Talbert Marsh. Potential contamination in tidal flows will be low enough when it reaches the ocean that beach closures should not occur.

Also, Talbert Marsh was designed with a proportionally large mudflat area that is exposed at low tide and inundated at high tide. Only a very small channel area is inundated at low tide. Birds feed, loaf and excrete on the exposed mudflat at low tides. Excretions are subsequently mobilized and contributed to the small tidal basin at rising tides and transported throughout the marsh. They are then carried out to the surf zone during a dropping tide and contributed to the ocean. In comparison, Bolsa has a relatively small mudflat area in proportion to the total wetland area. Therefore, lower concentrations of excretions are expected at Bolsa Chica.

There is no evidence that shows that bacteria from birds pose a threat to human health. However, without focused epidemiological studies, the potential for human health effects cannot be entirely discounted.

Talbert Marsh receives urban runoff directly from a large urbanized portion of Huntington Beach and Fountain Valley. Urban runoff contains bacteria that are contributed to pump stations upstream of Talbert Marsh each day. Bacteria breed in conditions present at pump stations, further increasing bacteria levels contributed to Talbert Marsh. In contrast, the Proposed Project does not include a connection to the EGGW flood control channel. Therefore, the contamination that is contributed to Talbert Marsh from outside of the system will not occur in the Proposed Project.

To determine for the FEIR/EIS whether the bacteria problems associated with Talbert Marsh were typical of coastal wetlands, 1999 beach posting data were obtained from the Natural Resources Defense Council, and summarized as follows:

The greatest amount of postings near wetlands were on beaches near Carpinteria Marsh and Goleta Slough in Santa Barbara County. The higher number of postings near these wetlands, compared to wetlands in the southern counties, is consistent with the overall higher number of postings and greater number of days posted in Santa Barbara County. The four postings at Carpinteria City Beach adjacent to Carpinteria Marsh were either associated with rainfall events or attributed to urban runoff. Similarly, the Goleta Beach postings were either associated with rain or urban runoff.

San Elijo Lagoon in San Diego County is frequently closed to the ocean. When the mouth is closed, pollutants build up inside the lagoon. Most of the 1999 beach postings at Cardiff State Beach occurred when the sandbar at the mouth of the lagoon was breached and accumulated pollutants were released to the ocean. Some beaches adjacent to wetlands, such as Carlsbad State Beach, adjacent to Agua Hedionda had no postings in 1999.

> *These data show that beaches near tidal wetlands do not have chronic beach postings. Postings on beaches near tidal wetlands are similar or lower than beaches that are not near tidal wetlands. Overall, beaches near tidal wetlands had an average of about 2 postings for 12 days in 1999 while beaches not near wetlands had an average of about 3 postings for 32 days.*

(Details of this analysis can be found in the Final EIR/EIS for the Bolsa Chica Lowlands Restoration Project, Volume V – Responses to Comments and Comment Letters and Mitigation Monitoring Plan, Section 2.2.3, Pages 2-3 through 2-9.)

The Final EIR/EIS for the Bolsa Chica Lowlands Restoration Project further states:

> *Finally, bacteria data within wetlands were examined to determine if bacteria generated by organisms within the wetlands caused bacterial standards to be exceeded within the wetlands. Table 2-3 shows monthly bacteria data collected by the County of Orange Environmental Health Division in Bolsa Bay and the EGGW Channel between August 1997 and May 2000. These data show that, except in rain events when large amounts of pollutants are introduced to Bolsa Bay from the EGGW Channel, the bacteria standard for a single sample was exceeded on only one occasion in Inner Bolsa Bay near the pedestrian bridge when the fecal coliform standard was exceeded. In Huntington Harbour at Warner Ave. where flows from Bolsa Bay exit the wetlands, there also was only one dry weather exceedance of bacteria standards, again for fecal coliform. Thus, in spite of the large number of birds that use Bolsa Bay, bacteria concentrations in the water are usually low. These data suggest that the Talbert Marsh situation may be unusual and that wetlands would not necessarily be expected to generate high enough levels of bacteria to result in beach postings. Data on bacteria levels measured by the County of Orange Environmental Health Division at Northstar Beach at the lower end of Upper Newport Bay were also examined. Upper Newport Bay receives runoff from storm drains and San Diego Creek and also contains marinas which may contribute bacteria. However, weekly bacteria measurements between January 1999 and November 2000 indicated only one dry weather exceedance of single sample bacteria standards at Northstar Beach. Large numbers of birds use Upper Newport Bay. Again the data suggest that exceedance of bacteria standards in tidal wetlands is not typical.*
>
> *In summary, existing information does not support a conclusion that the Proposed Project will cause or significantly contribute to high bacteria counts that necessitate additional beach closures.*

(Details of this analysis can be found in the Final EIR/EIS for the Bolsa Chica Lowlands Restoration Project, Volume V – Responses to Comments and Comment Letters and Mitigation Monitoring Plan, Section 2.2.3, Potential Exceedance of Bacterial Standards in the Ocean from Bacteria Generated by Birds and Wildlife in the Wetlands, Pages 2-3 through 2-9.)

Subsequent to the release of the Final EIR/EIS, numerical modeling of potential water quality impacts from bird use of Bolsa Chica wetland was recently performed by Moffatt and Nichol

Engineering (Letter to State Coastal Conservancy, from Michael J. McCarthy, P.E., Moffatt and Nichol Engineers, July 18, 2001)(**Appendix D**: "Final Letter Report, Numerical Modeling of Potential Water Quality Impacts from Bird Use of the Bolsa Chica Wetland", Moffatt & Nichol, July 18, 2001). This modeling evaluated: (1) a reasonable worst case scenario of bird use of the wetlands, tidal conditions and resultant enterococci bacteria concentrations; and (2) a worst case scenario (essentially inflating the impacts of the reasonable worst case scenario by a factor of five). In summary, the modeling for scenario 1 indicated:

> *The highest predicted enterococci bacteria concentration levels for the worst case condition in the marsh and nearshore area over the entire 45-day modeling period are two orders of magnitude lower than the applicable state criteria (AB411 30-Day Geometric Mean Standard of 35 MPN/100 ml). Therefore, no beach closures would occur from bird use of the marsh under the assumptions used for this analysis. In order to each an exceedance of the criteria, the concentration of bacteria would have to be increased 170 fold in the marsh. No physical (decreased tidal prism) or biological conditions (increased bird use) are anticipated for this to occur with the proposed project.*

Furthermore, modeling for scenario 2 indicated:

> *The highest predicted enterococci bacteria concentration levels for the worst case condition in the marsh and nearshore area over the neap tide modeling period are one order of magnitude lower than the applicable state criteria (either the AB411 30-Day Geometric Mean Standard of 35 MPN/100 ml or the instantaneous standard of 104 MPN/100 ml). Therefore, no beach closures would occur from bird use of the marsh under the assumptions used for this analysis. In order to reach an exceedance of the criteria, the concentration of bacteria would have to be increased 16 fold in the marsh. No physical (decreased tidal prism) or biological conditions (increased bird use) are anticipated for this to occur with the proposed project.*

The Commission staff believes that this recent modeling effort further supports the findings contained in the consistency determination and Final EIR/EIS, and that those findings are supported by analysis of the available data.

5. Conclusion. The Water Quality staff of the Commission has reviewed the consistency determination, the public comments and letters submitted during the public comment period, the most recent water quality research, and the analysis and response to comments presented in the EIR/EIS related to this issue. The staff agrees with the conclusions presented in the consistency determination that the restoration of the Bolsa Chica wetlands will not result in significant impacts to water quality or beach closures resulting from bird use of the marsh and wetlands area. The staff believes that the conclusions of the Final EIR/EIS are supported by analysis of the available data and most recent research. Water quality along the beaches and surf zone will continue to be monitored in accordance with the requirements of AB411. Research will continue into the relationship between wetlands and beach and nearshore water quality, and the

Commission staff will continue to evaluate all applicable water quality research as it becomes available.

E. ENVIRONMENTALLY SENSITIVE HABITAT. The Coastal Act provides:

Section 30230

Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

Section 30231

The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

Section 30240

(a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas.

(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.

The essence of this project is the creation, restoration, and substantial enhancement of important coastal biological resources. The project is designed to increase very significantly the diversity and abundance of important native species in all trophic levels and in numerous habitat types. The project is being funded by the Ports of Los Angeles and Long Beach and is, therefore, also designed to provide those entities with mitigation credits for planned development activities that will result in the fill of deep water habitats. This does not in any way diminish the value of the ecological benefits that result from the project, but is does constrain the proportional representation of the habitat types that will be created and the physical design of some elements of the project. Natural salt marshes tend to have numerous sinuous channels of a mix of sizes (orders), many of which are intertidal, and tend to have a large proportion of the acreage in middle marsh plain. The full tidal portion of this project is designed as a shallow tidal basin with a very large proportion of subtidal and low intertidal mudflat habitats; habitats that are of particular benefit to marine fishes and wading and shore birds. This project also includes large areas of mid to high pickleweed habitat that is physically separated by berms and subject only to muted tidal flows, non-tidal seasonal pond habitat, and least tern nesting islands in non-

traditional locations. These are not features that were found in the pristine salt marsh that once occurred at this location.

Attention is brought to this fact because it is a potential source of criticism, and it is reasonable to ask, "Are the unnatural design elements serious flaws in the proposed project?" In general, the Commission thinks the answer must certainly be "No." Today it would not be possible to recreate the historic saltmarsh that once existed at Bolsa Chica. Not only have there been practically irreversible physical changes (e.g., construction of the Pacific Coast Highway, Huntington Harbor, flood control structures, and a residential subdivision), and other draconian but potentially reversible alterations (e.g., dikes and fill of salt marsh for oil infrastructure and conversion of beach habitat to recreational areas), but there have been profound changes in the distribution and abundance of coastal species or populations. For example, California least terns and snowy plovers now occur in perilously low numbers and their natural beach habitats are no longer available. Similarly, Belding's savannah sparrows are much reduced in numbers and in many places now rely on marginal habitats such as the diked areas of pickleweed at Bolsa Chica that depend on rainfall for moisture. The goal of this restoration, then, is not to mimic some presumed historical landscape, but rather to create and restore as many functioning, interrelated elements of the historical ecosystem as is feasible, while preserving and enhancing some important ecological elements that are already present (e.g., seasonally ponded pickleweed and mudflat). The proposed project accomplishes this goal and is clearly the environmentally least damaging of the various reasonable design alternatives that were considered. Alternative 5, which involves irrigating and managing freshwater and seawater inputs, has few negative impacts, but it also has few ecological benefits and would minimally alter the ghost of a salt marsh ecosystem that currently exists.

The critical factor for saltmarsh restoration in southern California is a strong tidal connection to the sea. Under current conditions at Bolsa Chica the major habitat types consist of 318 acres of upland and saltgrass, 296 acres of non-tidal pickleweed, and 397 acres of perennial and seasonal ponds dependent on freshwater inputs. The proposed project would restore at least 348 acres to full tidal action and 179 acres to a muted tidal regime[1] (Table 4.5-3, EIR)(**Exhibits 17 and 18**). This will result in nearly immediate colonization by the marine invertebrates and algae that provide the basic trophic foundation that will support a diverse assemblage of marine and estuarine fishes, wading and shore birds, and open-water foragers such as terns and pelicans. It is estimated that there will be suitable cordgrass habitat for some 15 pairs of the federally endangered light-footed clapper rail, and that improvements in pickleweed habitat associated with tidal flushing will support an additional 255 pairs of Belding's savannah sparrows. If properly maintained, the constructed tern islands will likely support on the order of 220 California least terns, in addition to significant numbers of elegant, Caspian, and Forester's terns, and nesting habitat for around 68 additional pairs of snowy plovers.

There are additional opportunities for restoration associated with the 252 acres of habitat in the northeast corner of the lowlands that will probably continue to be in oil production for 15 to 20 years. The planned ocean inlet is adequately sized to provide full tidal flushing to this area. The

[1] In the text, the estimated acreages are 366.5 for full tidal and 200 for muted tidal.

current conceptual plan calls for eventual creation of a modified tidal basin which would be primarily open water and tidal mudflat habitat. The Commission staff believes consideration should be given to modifying that plan to provide additional acreage at Bolsa Chica of salt marsh habitats that are currently under-represented. In particular, this offers an opportunity to create fully tidal salt marsh broken by sinuous channels of various sizes that will complement the habitats planned for phase I of this project.

The only negative post-construction biological impacts directly resulting from this habitat restoration project are associated with habitat conversion and periodic maintenance dredging. In general, the existing areas that will be converted to tidal habitats are ruderal uplands, small areas of brackish marsh, and a small area of dune habitat that supports coastal scrub plants and coastal woolly-heads, a rare plant. The impact to coastal woolly-heads may be avoided by constructing berms or mitigated by propagating additional plants in an area where they are naturally more abundant. For dune-dependent insects, the proportion of dune habitat in the region that is being converted does not appear significant. The impacts to other vegetation are considered self-mitigating by creating tidal habitat that is more appropriate and valuable in this setting. The loss of upland foraging and roosting habitat for various species of birds will be offset by the creation of higher quality tidal habitats. Some mammals, such as the San Diego black-tailed jackrabbit will lose habitat, whereas others, such as the California salt marsh shrew, will gain habitat. Overall, the impacts do not appear significant and no species are likely to disappear from the Bolsa Chica lowlands as a result of the restoration.

About 150,000 cubic yards of material will be dredged from the tidal inlet every two years in order to maintain adequate tidal flushing of the restored area. This will be timed to avoid the period of grunion spawning. There will be ephemeral increases in water turbidity and the burial of intertidal and shallow subtidal organisms. However, these are also natural periodic phenomena and the organisms that live in habitats that are at risk are adapted to such conditions. Any impacts will be localized and recovery will be rapid.

The acute construction impacts are of greater magnitude. About 1,800,000 cy of material will be dredged as part of the construction of the full tidal basin. This will destroy the existing habitats and the associated organisms. The organisms affected are common and do not include sensitive species. This is an insignificant impact that is more than adequately mitigated by the creation of more valuable habitat that will promote a much greater diversity and abundance of organisms. Some material will be placed offshore into the ebb bar. This will have effects similar to those of maintenance dredging and will be similarly insignificant for the same reasons. A portion of beach will also be lost due to construction of jetties. The disturbed area of intertidal beach will recover quickly and the lost beach will be replaced by hard substrate that will soon develop a rocky intertidal biota.

There will also be impacts to existing habitats during staging and construction. One to one replacement of any disturbed vegetation is proposed. The vegetation that will be disturbed is primarily pickleweed and saltgrass. This is similar to the situation at San Dieguito in San Diego County where the Commission required 1:1 mitigation for seasonal salt marsh that is disturbed or converted to other tidal wetland habitat during the course of restoration.

There will be several temporary impacts to bird populations. The most significant is the loss of about 60% of the existing 213 Belding's savannah sparrow territories during construction. This will be mitigated by improving undisturbed pickleweed habit through water management. Higher quality habitat supports more birds per unit area because territories are smaller. Within 5 years of the completion of the restoration, the pickleweed in tidal areas is expected to provide a substantial net gain in occupied territories.

There may also be a loss of 10 to 21 of the existing snowy plover nesting sites (30, on average) during construction. To minimize impacts, replacement nesting sites will be constructed prior to excavation and a 100-ft buffer around active nests will be maintained. After restoration, there will be a large net gain in plover nesting habitat and in the number of nesting pairs expected.

There will be short-term losses of upland and non-tidal wetland habitat for waterfowl, wading birds, shorebirds, and upland birds. However, substantial areas of similar habitat will remain during construction (e.g., the future full tidal area, the muted tidal basin, and in the area of seasonal ponds), so temporary impacts will be minimal. The long term impact of the restoration on these species will be beneficial.

Construction activities will also disturb and displace some mammals during excavation of the full tidal basin. The temporary loss of habitat for the California salt marsh shrew will be more than compensated by the net gain in salt marsh habitat as a result of the restoration. Local populations of some upland species may be smaller following the restoration, but none are expected to disappear from the Bolsa Chica lowlands.

The goal of this restoration project is to restore estuarine and salt marsh habitats within the footprint of the historical area of tidal wetlands. Without question, the overall effect will be beneficial, increasing the health, abundance and diversity of habitats and their constituent species. However, it is reasonable to question whether these benefits will be long lasting in the face of the probable rise in sea level over the next many decades. The initial effect of rising sea level will be to increase the amount of open water habitat, shift intertidal habitat landward, and reduce the amount of upland habitat. However, since the site is constrained by topography and urban development, the ultimate effect will be to lose upland and convert some intertidal habitat to open water. This will change the way in which the ecosystem functions and will benefit some groups of species over others. However, the overall effect will still be a very considerable enhancement of natural resources within the region.